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ABSTRACT

Data from the California Development Department's Unemployment Insurance System were used to track the earnings and employment of more than 57,000 California Employment Training Panel (ETP) trainees served by ETP projects that ended in 1994-95 and 1995-96. ETP trainees' earnings gains averaged 15%, versus 11.8% in the case of similar workers who were not trained in an ETP program. Companies that participated in ETP grew faster than nonparticipating companies did (a growth rate of 14% versus -.8%). The $73 million spent by the ETP directly on training contracts was determined to have had an economic impact on California's economy estimated at more than $400 million. It was recommended that ETP take the following four actions: (1) continue to target its resources toward basic industries and companies that are below industry best practices; (2) encourage management reinforcement of training; (3) increase the amount of customized employer-provided training and reduce the amount of generic, training agency training; and (4) continue to attempt to measure the impact of ETP training on individual companies. (Contains 17 references and 42 tables/figures. A comparison of trainees before 1994, in 1994, and after 1994 and regression results are appended.) (MN)

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Training That Makes A Difference:

ETP's Impact on Trainees, Companies and the State's Economy

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Training That Makes A Difference:
ETP's Impact on Trainees, Companies and California's Economy

Executive Summary

Overview

The California Employment Training Panel (ETP) was established in 1982 to ensure that employers had the trained workers they needed to compete in a global economy. The Panel contracts with individual employers, groups of employers, and training agencies to provide the training it funds.[1]

This is the second report in a comprehensive evaluation of ETP's effectiveness. The first report of the study, *ETP AT Work*, summarized the results of 23 case studies, which examined the dynamics of ETP in the field and identified factors that affect ETP's impact on companies served. This second report presents the results of a large-scale statistical study of ETP's impact from three perspectives:

1. ETP's impact on individual trainee's earning and employment patterns,
2. ETP's impact on company growth,
3. ETP's overall impact on the State's economy.

Methods

This study used data from California Employment Development Department's Unemployment Insurance System to track the earning and employment of over 57,000 ETP trainees served by projects that ended in 1994-95 and 1995-96. The analysis used data from the same system to track employment and earnings growth within companies served by ETP. The experience of both individuals and companies served by ETP were compared with control groups of similar individuals and companies not served by ETP to estimate the impact of ETP. ETP's impact on the state's economy was estimated based on its impact on individuals and companies.

Results

Overall ETP trainees had greater earnings gains and more stable employment than similar workers who were not trained. Companies who participated in ETP grew faster than companies that did not participate. Finally, ETP was found to have a positive impact on the state's economy, which far exceeded its costs.

The experience New Hire trainees (trainees who were unemployed when they entered training) and Retrainees (employed workers who were trained by ETP) were examined

[1] *Employment Training Panel Strategic Plan 1998-2001.*

separately, and the experiences of trainees who dropped out and completed were compared as well. All trainee groups were measured against control groups of similar workers.

Both New Hires and Retrainees were more likely to remain in the California labor force after training than similar workers in the same industries. This study, unlike previous studies, found that dropouts and completers persisted in the labor market at the same rate, probably due to the current boom economy. Both New Hire and Retrainee completers had roughly equal earnings gains of about $3,600 or 15% over two years, compared to about $3,000 and an 11.8% increase for similar workers who were not trained by ETP. Again, dropouts did nearly as well as completers due to the prosperous economy.

Both New Hires and Retrainees experienced a sharp decline in the weeks they were unemployed after training. Overall we found ETP trainees had much more stable employment after training than similar workers. This meant they were unemployed less and were less likely to change industries. In this case completers differed from dropouts in that they had substantially greater increases in employment stability.

Companies who participated in ETP training grew faster than similar companies who did not participate. Employment in companies served by ETP grew over 14% from the year before to the year after training, compared to a small decline of -.8% for similar companies. Total payroll in ETP served companies grew by almost 26% compared to about 10% for similar companies. How fast companies grew was related to the type of training contract. Companies who contracted directly with ETP grew fastest, followed by companies that were served through consortia; companies served by training agencies grew slowest. The size of the training intervention seemed to make a difference as well; companies that trained over 10% of their workers grew substantially faster than companies who trained less than 10% of their workers.

The analysis estimated that the $73 million ETP spent directly on training contracts ending in 1994-95 and 1995-96 had an over $400 million impact on the State's economy in the year after training. The outcomes of ETP training had an impact on California's economy three ways: by increasing trainees' employment stability, increasing trainees' productivity, and saving California Jobs. Our estimates of each effect are:

Training Outcomes	Estimated Benefits
1. Increased employment stability for trainees	
✓ Unemployment Insurance fund savings	$2 million
2. Increased productivity of trainees	
✓ Increased trainee earnings	$33 million
✓ Increased sales by other California businesses	$17 million
3. Saving California jobs	
✓ Unemployment Insurance fund savings	$61 million
✓ Prevented temporary earnings losses by trainees	$167 million
✓ Prevented losses by other California businesses	$134 million
TOTAL	$414million

Recommendations

- **Increasing ETP's Impact on California's Economy**

1. ***ETP must strive to continually improve the quality of training offered through its contracts.***

Effective training is the foundation for ETP's impact on the California economy. The effectiveness of the training determines whether or not trainee productivity increases. It is through increased productivity that ETP enhances California companies' competitiveness, saves California jobs, raises workers' earnings, and increases their employment stability.

2. ***ETP must continue to target its resources on basic industries.***

Increasing the productivity and competitiveness of California's basic industries leverages ETP's impact on the California economy. When these businesses grow they generate more business for other California companies and more jobs for California workers. Serving these basic industries should remain a priority.

3. ***ETP should increase the proportion of its funds targeted on retrainees threatened with displacement.***

Saving California jobs produced ETP's largest monetary impact on the California economy, therefore it should be ETP's top priority. Had the jobs that were threatened by out-of-state competition been temporarily lost for just the length of the average unemployment episode, California would have lost over $362 million in additional unemployment claims, decreased business and earnings, and negative indirect effects on California suppliers. ETP should increase the proportion of its funding targeted on potentially displaced workers.

- **Increasing ETP's Impact on Companies**

4. ***Target ETP training on companies that are below industry best practices.***

Companies whose operations were far below industry standards had the greatest potential gains from ETP training. Similarly, workers in these low performing companies are most at risk for losing their jobs, and saving those jobs is the most efficient way for ETP to have a positive economic impact on the state. Thus targeting ETP funds on companies whose practices are substantially below their industries' best practices will increase ETP's impact.

5. ***ETP should encourage management reinforcement of training.***

Even poorly planned, low-quality training can have a positive impact on companies if management provides strong reinforcement of the skills and techniques learned. Conversely, well-planned, high-quality training can fail to yield positive results if there was not systematic management reinforcement. ETP should use its contracting and monitoring processes to promote management reinforcement of training.

6. ***Increase the amount of customized employer-provided training and reduce the amount of generic, training-agency training.***

This study reveals that the most effective training model is the employer contract where a company provides customized training to its own workers. Our analysis shows that in recent years, ETP funding has shifted away from the customized, employer-provided training to the generic skills training agency contracts. For example, training agency contracts served 20% of all trainees in 1994-95. In 1995-96 they served 30% of all trainees, a growth rate of 50%. We found the generic skill training which employees do on their own time to be the least effective. If ETP wishes to increase the impact of ETP training on companies we recommend this trend be reversed. Thus we make the following specific recommendations:

6a. ***Do not fund training where employers are not paying a significant share of the costs.***

6b. ***Phase out generic skills training over two years and increase the focus on industry specific skills training.***

7. ***ETP should not require that a minimum or maximum proportion of a company's workers be trained.***

While we found a limited positive association between the percent of workers trained and the impact on companies, the increase in impact was not directly proportional to the increase in employees trained. It does not appear that there is a minimum proportion of workers that must be trained for ETP to have a positive impact, nor does there appear to be a point at which the impact of ETP training dramatically diminishes as the proportion trained rises. Hence we do not recommend setting a minimum or maximum proportion of workers to be trained. This is probably a decision best left to employers.

8. ***ETP should continue to attempt to measure the impact of ETP training on individual companies.***

Despite a widespread interest in the impact of training on company performance there are few published studies. This study showed that it is possible to obtain valid and reliable data on company growth, which can be accurately benchmarked against similar companies. We recommend that ETP explore ways to collect the company growth data on a regular basis for ETP companies and a comparison group to provide a regular method of monitoring ETP's impact on the companies served.

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Introduction

The California Employment Training Panel (ETP) was established in 1982. It is supported by a special employment training tax, which is levied on the California employers who participate in the Unemployment Insurance system, at a maximum of $7 per employee annually. ETP expects revenues of $102.1 million in 1998-99, of which $90.7 million will be available for training. The Panel contracts with individual employers, groups of employers, and training agencies to provide the training it funds.[1]

Two recent nation-wide studies of state-run incumbent worker training programs, one from the National Governor's Association and one from the U.S. Department of Labor, recognize that ETP is the largest and most sophisticated program of its type in the nation. Both reports also note that serious evaluation studies of incumbent programs are sorely lacking. ETP is the exception. It has subjected itself to periodic independent evaluation of its impact on both individual trainees and the state's economy repeatedly over its history (Duscha and Graves, 1999; Regional Technology Strategies, 1999). This report presents the most recent comprehensive evaluation of ETP's impact on the workers trained, the companies that employ them, and the state's economy as a whole.

This study is designed to evaluate the performance of the California Employment Training Panel in relationship to its mission, which is:

ETP Mission Statement

> *The Employment Training Panel is a significant economic development tool for business attraction and business retention. ETP will work in partnership with business, labor, and government to provide funds for training California's workforce in the skills necessary for businesses to remain viable and compete in the global economy, while providing workers with reasonable wages and secure employment.*[2]

The mission shows that the ETP program is designed to have impacts at three different levels. First the program aims to increase the employment stability and incomes of individual workers trained under the program. Next, the program aims to increase the competitiveness of California companies in basic industries.[3] Finally, the program is intended to have a positive impact on overall California economy. In this component of the evaluation we attempt to measure the success of ETP in program years 1994-95 and 1995-96 in achieving these goals.

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[1] *Employment Training Panel Strategic Plan 1998-2001.*

[2] *Employment Training Panel Strategic Plan 1998-2001.*

[3] A basic industry is one that exports most of its products to customers outside the region in question. The essential notion of a basic industry is that it is not dependent on local demand for its business and that additional activity in basic industries will spawn even more local activity since the basic industry buys many of its inputs locally. Consequently, growth in basic industries will spur even more growth in the local economy.

Is there Underinvestment in Training?

ETP's very existence assumes that private employers are underinvesting in training their workers, or else there would be no need for ETP intervention. In fact, there is mounting evidence that American employers do underinvest in worker training and further evidence that California employers often invest even less than the national average. A number of researchers have compared U.S. employers' patterns of investment in training with similar companies in Europe and Japan and concluded that the U.S. companies are underinvesting (see for example Lynch, 1993 and Bishop, 1995). Underinvestment seems to be particularly acute when it comes to the non-college educated workers, who make up the large majority of the workforce. Lynch (1993, p.2) sums up the situation this way:

> Underinvestment in training in the U.S. appears to be of two forms. First, in certain sectors, U.S. firms may be spending less and providing more limited training to their non-technical or non-managerial employees than their competitors in other countries. Second, in other sectors the level of expenditures or hours of training may be the same, but due to lower initial skill levels, this level of investment is not sufficient to achieve the same degree of skill proficiencies found in countries such as Japan or Germany.

Bishop (1995) examines in detail a number of specific barriers to employer investment in training and concludes that high turnover rates in most U.S. companies yields lower returns on training investment, decreasing employers' investment below what would be optimal from a public point of view.

Lester Thurow, economist and Dean of MIT's Sloan School of Management, reviewed the current state of the American economy and notes the underinvestment in training by both companies and individual workers. He explained the dynamic that leads to underinvestment this way.

> The basic problem in the United States is that every employer wants a free ride in the training system. "You train, I'll hire" is the American way. Whenever unemployment is low, employers who themselves do no training, bitterly complain about the shortage of trained workers. They see nothing strange about their complaints. As for employees, without career ladders they can not intelligently acquire the right skills on their own. Since they will be switching employers frequently, they do not know which skills they will need or how long those skills will be relevant to their earning opportunities. As a result—rationally—they don't invest in skills (Thurow, 1999, p.69).

Not only do employers tend to underinvest in training in general, but they particularly underinvest in training workers who are not in professional or technical jobs. Generally, employers invest the large bulk of their training dollars in college educated workers. For example, a recent comprehensive survey of employer provided training by the Bureau of Labor Statistics found that only 60% of workers with a high school education or less received formal training from their employer in the last year, compared to 90% of employees with a bachelors

degree or higher levels of education. The study also found the amount of training varied substantially. On average those with a high school degree or less received 10.9 hours of formal training compared to 16.1 hours for those with a bachelor degree or higher (Frazis, et. al., 1998)

California businesses tend to invest even less than the national average. In a statewide survey of a representative sample of California employers with over 20 employees, researchers at UCLA found that California employers were even less likely than employers nationally to invest in training. In all six categories of training studied California lagged behind the nation for companies with over 250 employees. For example, nationally 58% of companies with over 250 employees said they provided training in "production skills," but only 32% of similar California employers said they did the same. The results for companies with between 50 and 249 employees were more mixed, but only in the area of computer skill training was California consistently ahead of the nation (Erickson et. al., 1998).

In short, available research indicates that the need for ETP to serve as an incentive for employer investment in training frontline workers remains strong.

Benchmarking the Impact of ETP Training

In evaluating the impact of ETP training the question always arises: How much of an impact is enough? We consulted available research on the impact of employer-provided training against which to benchmark the performance of ETP Retraining programs, and consulted the research on displaced worker retraining to benchmark ETP's New Hire training.

- **Retraining Benchmarks**

Human capital theory suggests that training workers will make them more productive and increased productivity will lead to increased earnings (Becker, 1975). Research studies support this view and have found a positive impact on workers' earnings when they receive employer-provided training (see for example Lillard and Tan, 1985; Mincer, 1989; Hollenbeck and Wilkie, 1985; Lengermann, 1996). These impacts range from about a 5% to 12% increase in earnings, and the results vary with the population studied and how earnings were measured. Previous research on ETP found that the impact of ETP training was similar to that of private employer-provided training and much greater than other public training programs such as JTPA (Moore, Blake and Phillips, 1995; Moore, Blake and Phillips, 1994). The question for this study is: Has the impact of ETP training remained at the level of private employer-provided training during the current period of economic growth?

- **New Hire Benchmarks**

Two sophisticated studies of displaced worker retraining programs provide valuable benchmarks for evaluating ETP New Hire training, one done in Texas (Bloom, 1990) and one in New Jersey (Anderson, et. al., 1990; Corson, et. al., 1989). These studies used an experimental design and found impacts of only several hundred dollars in the first year after receiving services. The New Jersey study (Corson, et. al., 1989) examined three different types of services: job search, job

search and a cash bonus for finding a job, and job search with training. Surprisingly, the treatment that involved training had the smallest impact on earnings, about $200, of all the services tested. In a longer-term follow-up of these workers (Anderson, et. al., 1990) researchers found none of the three groups had earnings gains that exceeded inflation. The Texas study (Bloom, 1990) found substantially larger impacts, ranging from $673 for men to $1,148 for women, who received a mixture of job search and short-term skill training services.

Recent data on changes in earnings from the year before to the year after training for participants in California's JTPA title III program provide another benchmark. According to this analysis, workers who completed training had median earnings gains of $5,161 and those who left without completing experienced median gains of $1,606. Suggesting that the value of completing training is $3,555 (State Job Training Coordinating Committee, 1998).

Overview of this Study

We begin by examining the impact of ETP training on the individual workers served. We do this by examining the trainees' attachment to the labor force, their individual earnings before and after training, and patterns of employment and unemployment before and after training. ETP trainees are compared with a random sample of California workers (the Control Group) who have been matched to ETP trainees based on their industry of employment. Also, ETP trainees who completed training (called completers) are compared with trainees who did not complete training (called dropouts). Finally, ETP trains two types of trainees: *Retrainees*, who are currently employed workers, and *New Hires*, workers who are unemployed and who are collecting Unemployment Insurance or who have exhausted their benefits. The experiences of these two groups will be examined separately. That is, the experience of Retrainee completers and dropouts will be compared to that of the Control Group and with one-another. The same comparisons will be made for the New Hire completers and dropouts.

Next we turn our attention to the impact of ETP on the companies which employed the trainees, by benchmarking the growth of these companies against that of other similar companies not served by ETP.

Finally we estimate the impact of the entire ETP program for the years studied on the overall California economy.

Methods

Trainee Analysis

- **Objectives**

The trainee analysis had three objectives:

1. Measure the labor force attachment of trainees in the year before training and the two years after training in comparison with the Controls.

2. Measure the change in earnings and unemployment for those trainees who remained in the labor force through out the two-year follow-up period, again in comparison with the Controls.

3. Measure the employment stability of trainees before and after training, in terms of their level on unemployment and stability within a particular industry, in comparison with the Controls.

- **Trainee Population**

We begin the analysis with a discussion of the characteristics of ETP's trainee population. The population we studied includes all trainees who were served by ETP projects which ended in fiscal years 1994-95 and 1995-96, and it included both those who completed training and those who dropped out. Because of the length of time ETP projects take to complete, this study includes projects, which began as far back as 1992-93. In total we included 323 projects and 57,473 participants in the analysis.

Table 1
Study Population

Trainees	Projects Closed 1994-95 (No. of Projects =214)	Projects Closed 1995-96 (No. of Projects =109)	Total Number	Total Percentage
Retrainees Total	**34,780**	**18,350**	**53,130**	**92.4%**
Completers	27,441	15,132	42,573	
Dropouts	7,339	3,218	10,557	
New Hire Total	**2,347**	**1,996**	**4,343**	**7.6%**
Completers	1,031	1,097	2,128	
Dropouts	1,316	899	2,215	
Total Trainees	**37,127**	**20,346**	**57,473**	**100.0%**

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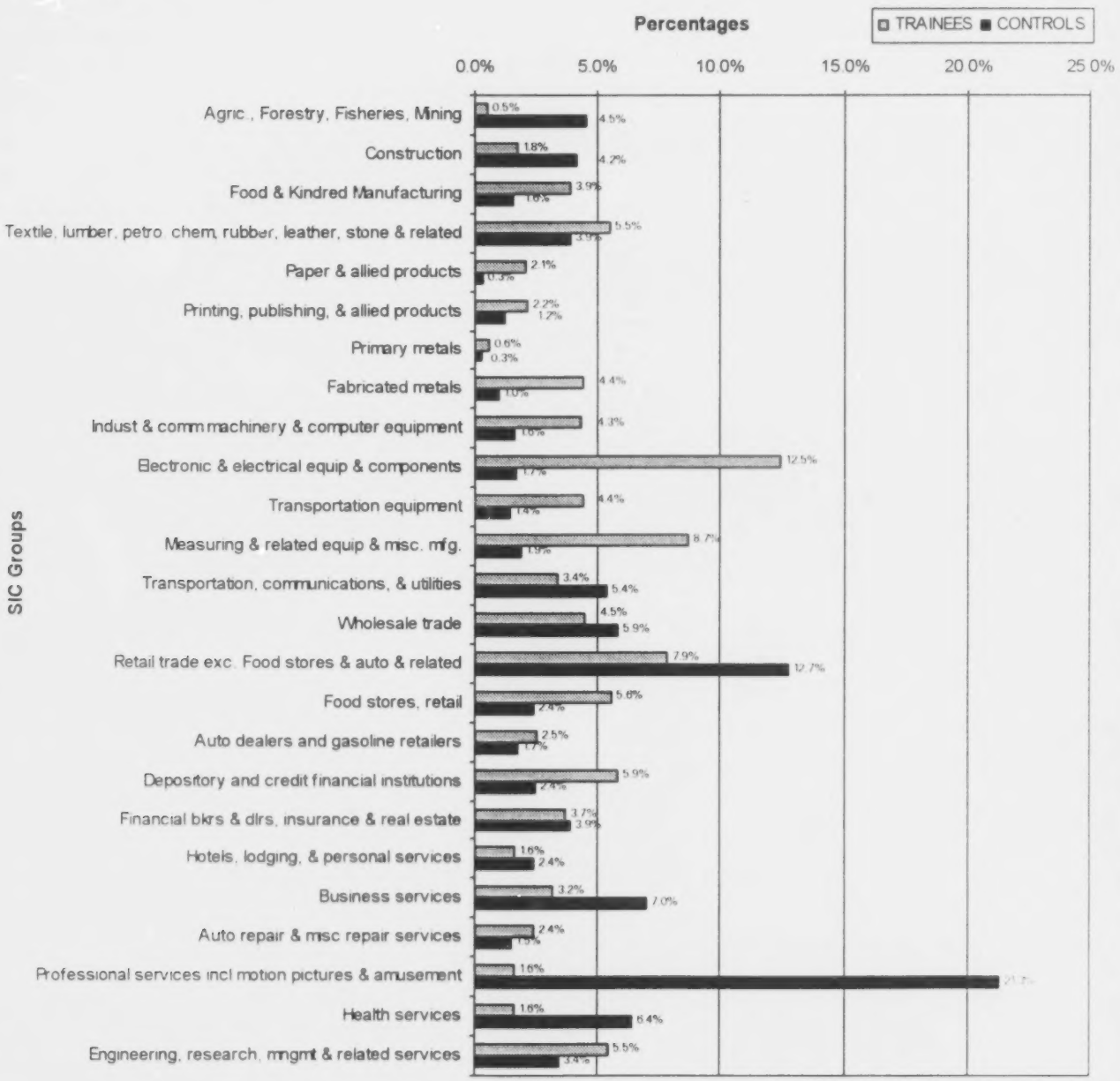
The period studied was one of rapid economic change. The California economy was emerging, late, from the national recession of the late 1980's and early 1990's. This was a period of rapid economic growth in which job creation was slow at first but then accelerated. We were concerned that differences in the changes in earnings and employment might be attributable to the period in which observations were made rather than the impact of training. For example, a trainee exiting a program in 1993 when employment was growing slowly might not have the same opportunities or wage increases as a trainee who exited in 1995 when the employment was growing rapidly. To control for the shifting economic conditions that occurred during the time period we studied, we divided the trainees into three groups based on whether they exited training before 1994, during 1994, or after 1994. We compared the experiences of the trainee groups to those of three corresponding Control Groups, which were random samples of 1% of all California workers drawn from the second quarters of 1993, 1994, and 1995. We then followed all trainees for two full years after exiting the program. The results of this analysis can be found in Appendix A. Our analysis showed that the experience among the three groups of trainees were not dramatically different so they were merged back together for the analysis presented here.

Figure 1 shows the distribution of all ETP trainees in the study across industry groups in comparison with a random sample of one percent of all California workers. ETP trainees were assigned to an industry group based on the SIC code of their employer during training. The Control Group members were assigned an industry groups based on the SIC code of their employer in the quarter in which they were sampled. This analysis provides a quick profile of the industries served by ETP and their relationship to the larger California economy (represented by the Control Group). The graph shows that the three industries with the largest number of ETP traineees were: electronic and electrical equipment and components manufacturing; measuring and related equipment and miscellaneous manufacturing, and retail trade. By and large this distribution reflects ETP's focus on basic industries, particularly high technology manufacturing.

Figure 1
SIC Group Distribution of the Trainees and Controls



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- **Measurements: The Data**

The data on the number and characteristics of the trainees were taken from ETP trainee and contract files. Their earnings and employment experiences were extracted from the Base Wage File and Single Client Database which are maintained by the California Employment Development Department. These earnings and unemployment data pertain to Unemployment Insurance (UI) covered jobs in California. There are a number of jobs in California that are not included in the Base Wage File. Federal employees, military personnel, and the self-employed are the most prominent of these, but there is a miscellaneous group of other California jobs not covered by the UI Base Wage File. People employed in these jobs will not show up in the databases we used to track Trainees and Controls. The reader should be cautioned that all of our results concerning labor force participation, earnings, and unemployment claims are conditioned on being in UI-covered employment in California. Obviously, Trainees and Control group members who find jobs in non-UI-covered employment will disappear from our databases.

✓ **Labor Force Attachment**

Trainees and Controls were classified as in the labor market if they had either $1 of earnings or a UI claim in any given quarter. Attachment is reported as the percent of trainees or Controls who met this criterion. This analysis was <u>not</u> restricted to trainees found in the workforce the fourth quarter before training, fourth quarter after training and eighth quarter after training. Essentially we calculated the percent of the 57,473 trainees who were in the labor market each quarter. Aggregate trainee earnings and unemployment claims, used in the economic impact analysis, were also taken from this unrestricted database. Another measure of attachment is the percentage of trainees found in the 4^{th} quarter before training, and the 4^{th} and 8^{th} quarter after training. This measure is a byproduct of the earnings comparisons and is discussed below.

✓ **Earnings**

Individual earnings were based on earnings reported quarterly in the Base Wage File by employers to the California Employment Development Department as part of the Unemployment Insurance Tax collection system. To calculate an individual's quarterly earnings, all wages and salaries reported by any employer for a quarter were totaled. Aggregate earnings and unemployment data, used in the company impact analysis, were taken from EDD's ES 202 File. All earnings were adjusted for inflation to 1995 dollars.

✓ **Unemployment Insurance Claims**

The UI single Client Database in the California Employment Development Department provided the number of weeks in each quarter that an individual claimed Unemployment insurance compensation and the dollar amount paid each individual in Unemployment Insurance claims.

- **Measurements: The Year Before and after Training Period**

ETP projects may begin any time and run from six months to two years. In order to define the year before and after training, we calculated a unique year for each trainee using the enrollment date and the completion or dropout date. From the enrollment date we went back in time to the end of the last complete quarter and then counted back four quarters to make the year before. For the post-training year we took the exit date, went forward to the beginning of the first complete quarter, then counted forward four quarters, to define the year after training and then to the eighth quarter after training to define the second year after training.

- **Measurements: Earnings and UI Comparisons**

To make before and after earnings and other comparisons, we defined a group of trainees who were attached to the California labor market for the entire period. Specifically, we selected the subgroup of trainees and Controls who were attached to the California labor market the fourth quarter before training and the fourth quarter and eighth quarter after training because they reported either wages or UI payments in those quarters. The figure below shows these selection criteria. This criteria assumes that if a trainee was in California the 4th quarter before training, and was here obviously for the training, that is possible to calculate an accurate year before training measure. If a trainee is not found in one of the three quarters between the 4th quarter before training and the training period, a "0" is assumed. Similarly, if a trainee is in the California labor market in the 4th quarter after training and the 8th quarter after training, but missing in intervening quarters we assume a "0" value for those quarters.

If a trainee is not present in the critical (-4, +4, +8) quarters he or she is dropped from the analysis because we can not confidently assume the individual was in the UI-covered California labor market for the period under study. For example, a trainee who is found the 4th quarter before but not in the 4th or 8th quarter after may have left the labor force, because she had a child and stopped working, went to college, joined the military, died, or moved out of state to work. Also, the person may have moved to a job in California that is not covered by UI and therefore not in the UI database. Hence, to assume 0 earnings would be false, and underestimate the real average earnings of the group. Conversely to include only those workers found in every quarter, would falsely overestimate the average earnings because no trainee would ever be unemployed. The method we chose allows us to assume some quarters of 0 earnings, but reasonably ensure that all subjects were in the California labor market for the period under study.

Figure 2
Selection Criteria for Trainee Labor Market Outcomes Analysis

Q-4	Q-3	Q-2	Q-1	Training	Q+1	Q+2	Q+3	Q+4	Q+5	Q+6	Q+7	Q+8

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- **Control Group Population and Database Adjustments**

We selected three Control Groups by taking one percent of all California workers reporting wages or UI claims in the 2nd quarter, 1993, 1994, and 1995. These Control Groups were then used to benchmark trainee changes in wages, UI payments, and UI weeks during the various periods of the economic recovery in California in the final analysis.

Because we used the second quarter to draw each Control sample, the quarterly data for the Control Groups showed a significant seasonal pattern, which was not present in the trainee data. The Control Group data were seasonally adjusted to purge this pattern and reveal longer-term trends. To do this we smoothed the quarterly data by averaging a quarter with two quarters before and one quarter after to generate a rolling quarterly average; this provided a more valid benchmark against which to judge the trainees' experiences.

The ETP trainees represented a different mix of industries than the Control Group as revealed in Figure 1. To adjust for this difference, we assigned all trainees to one of 25 industry groups. We also divided the Control Groups into the same 25 industry clusters. We calculated outcomes for all 25 industry clusters within the Control Group, and we then weighted the outcomes for each cluster within each of the three annual Control Groups to match the industrial mix of trainees in each of the three trainee cohorts. The industry-weighted outcomes from these three Control Groups were compared to that of the corresponding trainee groups. Since the differences between the trainee groups and the corresponding annual Control Groups were very similar, we report the differences between all trainees and "composite" Control Group made up of all three annual groups. To obtain the composite Control Group, we weighted the outcomes of the three Control Groups a second time to match the size of the corresponding trainee groups. Thus, the composite Control Group represents a group of workers from the same years and industries as the trainees. Similarly the overall Control Group is representative of the same industry mix as the entire group of trainees.

Finally, in the earnings and UI comparisons we used the same criterion for the Controls that we applied to trainees, (-4, +4, +8) to ensure that the Controls selected were in the California labor market for the period under study.

Economic Impact Analysis and Company Analysis

Details on the methods used to evaluate ETP's impact on the state's economy, and ETP's impact on individual companies are provided along with the results of these analyses in later sections.

Results

Trainee Results

As we noted earlier in the methods section, we first examined the trainees as three separate annual cohorts with three separate Control Groups. We compared the results of the three annual cohorts and found their experiences to be similar (complete results for each cohort are an appendix). For simplicity the results for all three groups of trainees are presented together as a single group for all earnings and employment measures. The results reported for the Control Group are a weighted average of the experience of the three annual Control Groups.

- **Completing Training**

Completing training is the first measure of a successful program. ETP only pays for trainees who complete all training and are retained on a related job for 90 days. Dropouts are any trainees who do not complete all training and the required 90-day retention period. It is ETP's policy not to officially enroll trainees until they have completed 20% of the planned training or 40 hours. Therefore, one can assume that all dropouts have received some of the planned training. Thus, dropouts do not represent a lost investment for ETP. But they do represent an administrative problem for ETP in that money is encumbered for candidates who enter training and do not complete. They also cost the ETP staff time that went into developing the project and monitoring it.

Dropouts represent a real cost to employers because ETP does not reimburse any costs for the training of employees who do not complete training. However, the extent of the employers' costs will differ by the reasons that the dropout occurred. Some dropouts are workers who were enrolled in training and completed a minimum amount of training because unexpected new orders for output required these workers return to production full time. Other dropouts may have actually taken part in more but not all of the training before being recalled to production by the employer. Obviously, some dropouts are people who quit their jobs or were laid-off during training or after training but before end of the 90-day certification period. All of these dropout cases represent some costs for the employer, the extent of which depends on how far the trainee got in the training process. At a minimum, the employer bears the costs of developing the training plan and shepherding the ETP contract through the processes for approval for trainees who enroll but only attend a minimal training. Generally, employers bear real costs for dropouts but in some cases those costs may be offset by increased profits derived from unexpected new orders. In those cases, even the rationale for training may disappear as a previously difficult competitive situation for the company melts away in the face of new orders by customers. These situations certainly occur more frequently in a period of economic recovery, and can be expected to substantially affect the labor market experience of the dropouts.

A final dropout cost for the trainees and the employer is that dropouts may represent unrealized potential gains because one expects that ETP training will have a positive impact on employee and company productivity. Workers and employers who drop training will not make those

expected gains. However, dropouts and their employers may receive partial benefits from the training since many dropouts complete some part of the process. Also, companies that have initiated training contracts with ETP and then receive unexpected new orders must balance the expected ETP training gains against the profitability of the new orders. The unexpected new orders may offer profitable and productive new opportunities for the company and its workers. Hence, in comparing completers and dropouts one should remember that partial training can have a positive impact on dropouts, and that in good times dropouts may be in companies with new and productive opportunities.

As the graphs below indicate, in the cohort of Retrainees studied here 80.1% completed. This fits with the previous study showing that about 80.4% of Retrainees complete training (Moore, Blake, Phillips, 1995). However, only 49.0% of New Hires completed training, which is below the 56.0% completion rate reported for the 1990-91 cohort studied in the earlier ETP evaluation (Moore, Blake, Phillips, 1995).

Figure 4
Retrainee Completers vs. Dropouts

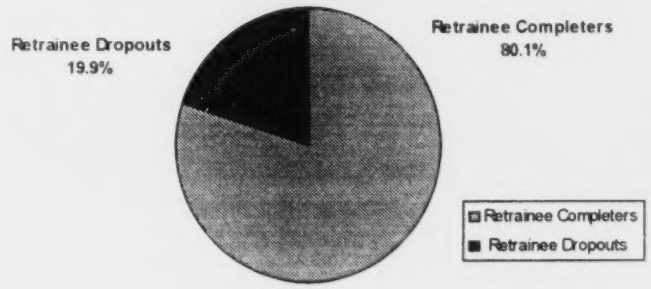
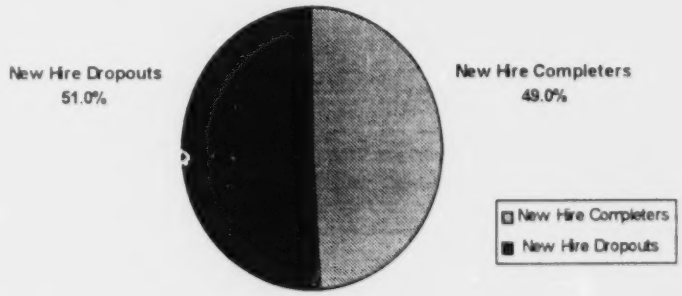


Figure 5
New Hire Completers vs. Dropouts



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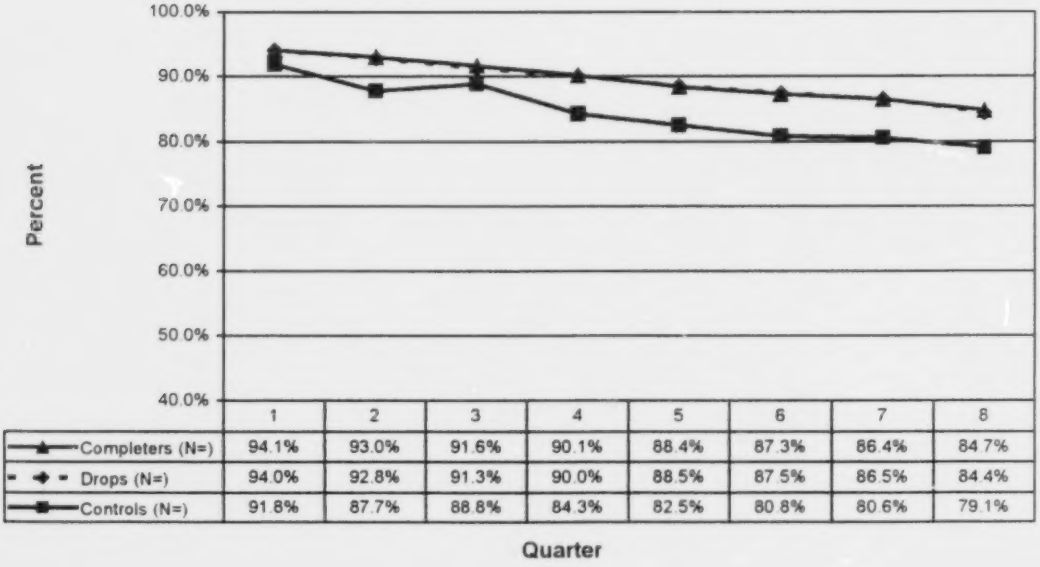
- **Labor Force Attachment**

Labor force attachment is calculated as the percent of trainees and Controls who were found either employed in a UI covered job or collecting UI benefits in any of the four quarters before training or eight quarters after training. As the following graphs indicate quarterly labor force attachment data show that the Retrainees were significantly more attached to the labor force than the Control Group. Immediately after training the gap was to 2%, but then begins to increase reaching 6% in the eighth quarter. These results indicate that over time Retrainees are more likely to persist in the labor force than most workers are. Interestingly, there was almost no difference between the experience of dropouts and completers, previous studies had found that completers were far more likely to persist in the labor force over time. This narrowing difference is probably the product of the faster growing economy and the increasing number of jobs available in the labor market during the follow-up period.

Figure 6 - Quarterly Retrainee Labor Force Participation



	1	2	3	4	5	6	7	8
Completers (N=)	94.1%	93.0%	91.6%	90.1%	88.4%	87.3%	86.4%	84.7%
Drops (N=)	94.0%	92.8%	91.3%	90.0%	88.5%	87.5%	86.5%	84.4%
Controls (N=)	91.8%	87.7%	88.8%	84.3%	82.5%	80.8%	80.6%	79.1%

New Hire trainees were also more likely than Controls to persist in the labor force after training relative to the Controls. In the fourth quarter after training 89.2% of New Hire completers and 88.8% of New Hire dropouts were still in the labor force compared to 84.3% for Controls. Again the gap between trainees and Controls was smaller immediately after training, about 2%, but grew over the eight quarters to over 5% with completers and over 7% with dropouts. The surprising finding here is that dropouts were slightly more likely to persist in the labor force after training. It may well be that dropouts are leaving training because they have other valuable options, and that is showing up as slightly higher labor force attachment.

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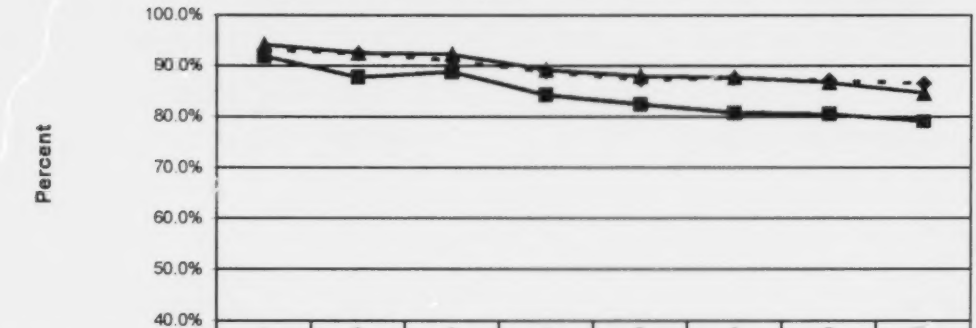
Figure 7 - Quarterly New Hire Labor Force Participation

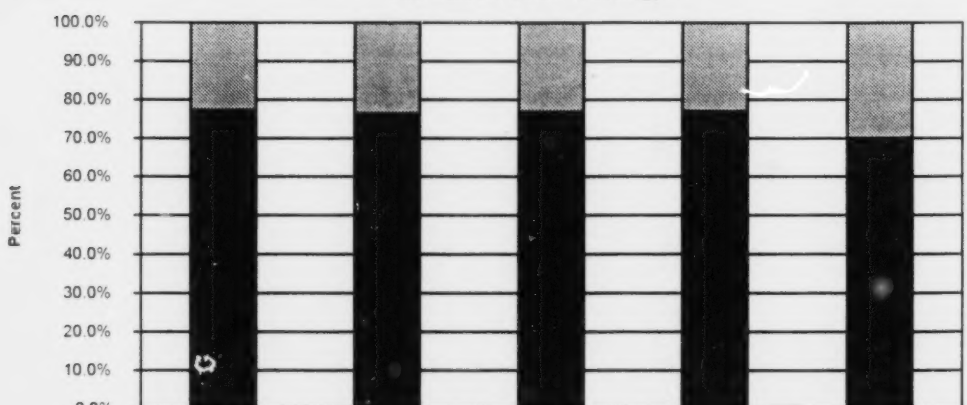


	1	2	3	4	5	6	7	8
Completers (N=)	94.2%	92.5%	92.3%	89.2%	88.0%	87.7%	86.7%	84.6%
Drops (N=)	93.2%	92.4%	91.0%	88.8%	87.3%	87.6%	87.1%	86.5%
Controls (N=)	91.8%	87.7%	88.8%	84.3%	82.5%	80.8%	80.6%	79.1%

Quarter

Another measure of attachment to the labor force is a byproduct of our earnings analysis. To compare earnings before and after training we defined a subgroup of trainees who were in the labor force in the 4th quarter before, and the 4th and 8th quarters after training. Applying this criterion we found that about 77% of all trainee groups—Retrainees and New Hires, completers and dropouts—persisted in the labor market for the period we studied. On the other hand, only 70.1% of Controls remained in the labor market for the entire period. Thus, the trainees are about 10% more likely to be attached to the labor force than the Controls.

Figure 8 - Labor Force Attachment (Found in 4th Quarter Before and 4th & 8th Quarter After Training)



	Retrainee Completers (N=42,573)	Retrainee Drops (N=10,557)	New Hire Completers (N=2,128)	New Hire Drops (N=2,215)	Controls (N=126,522)
Not Found	22.7%	23.6%	23.3%	23.1%	29.9%
Found	77.3%	76.4%	76.7%	76.9%	70.1%

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The most striking feature of this analysis is the high level of labor force attachment found in all groups. Approximately 90% of all trainee groups and nearly 85% of the Control Group were still in the California labor force in the fourth quarter after training. This compares with our previous study which found, 94.1% of Retrainee completers and only 82.0% of Retrainee dropouts, 89.7% of New Hire completers and 68.8% of New Hire dropouts compared to 79.6% of Controls in the labor market the year after training. The labor force attachment of both groups of dropouts is much higher in this study than in the earlier study (Moore, Blake, Phillips, 1995).

- **Change In Earnings**

The change in annual earnings is measured from the year before training to the first year after training and then to the second year after training. As mentioned, we restricted this analysis to trainees who could reasonably be assumed to have been in California and available for work during the time period studied. This subgroup consisted of those trainees and Controls who were in the UI-covered California labor market in the fourth quarter before training and fourth quarter and eighth quarters after training. We then compared the annual earnings and UI claims of Retrainees and New Hire completers and dropouts to that of the Controls.

✓ **Retrainees: Change in Earnings**

Table 2
Retrainee Change in Annual Earnings

Group	Change Year Before to Year 1 After		Change Year Before to Year 2 After	
	$ Change	% Change	$ Change	% Change
Retrainee Completers	$2,625	10.9%	$3,625	15.0%
Retrainee Dropouts	$2,390	9.7%	$3,649	14.7%
Controls	$1,541	6.0%	$3,025	11.8%

Figure 9 - Percent Change in Annual Earnings - Retrainees

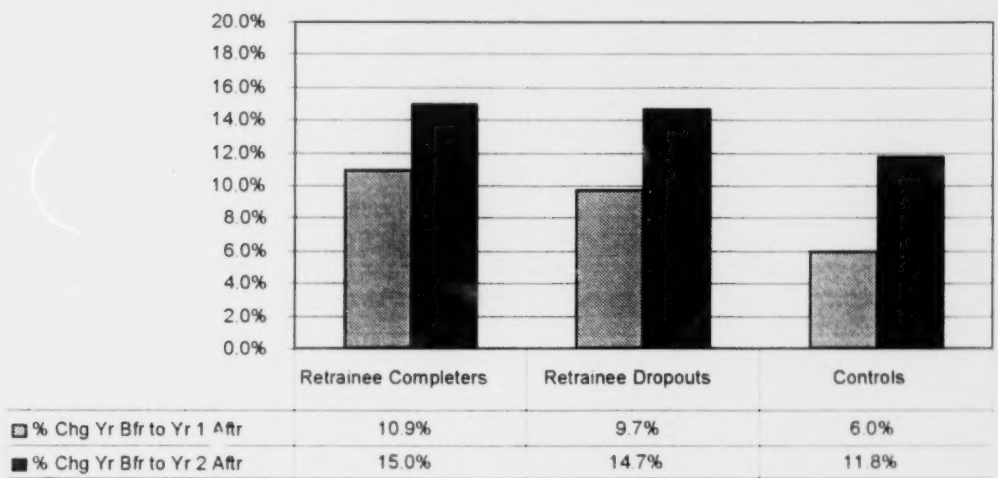

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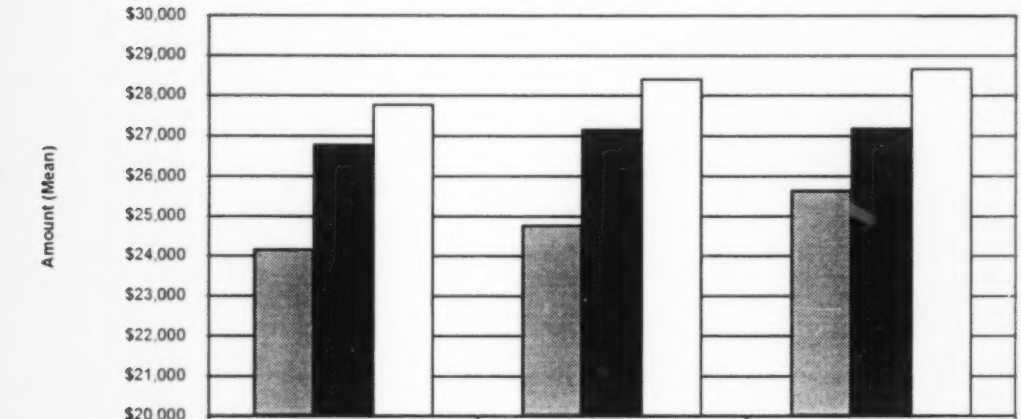
Figure 10 - Retrainees
Annual Earnings



	Completers	Drops	Controls
Year Before Training	$24,155	$24,760	$25,642
Year After Training	$26,780	$27,150	$27,183
2 Years After Training	$27,780	$28,409	$28,667

Groups

Retrainee completers and dropouts, as well as the Controls showed increased earnings for both years after training, as Table 2 indicates. This reflects the overall prosperity in the economy and generally rising earnings of California workers. Completers gained slightly over $2,600 in the year after training and dropouts gained about $2,400 compared to only about $1,500 for Controls. By the end of the second year of training, the earnings gaps narrowed substantially, while second year gains for completers and dropouts were both about $3,600 more than the year before training, and the gains for Controls rose to slightly more than $3,000, for a second-year difference between the trainees and Controls of $600.

A variety of studies estimate the impact of employer-provided training on trainees earnings at between 5% and 12% (see for example Erickson, et. al., 1998 or Lillard and Tan, 1986). The increases we observe fit with these earlier findings. The simple change in earnings from year before to year after training represents a 10.9% increase for Retrainee completers, a 9.7% increase for dropouts, against a 6% increase for Controls. Using the Controls as benchmark for what would have happened to completers without training, the impact of training was 4.9%, an effect similar to the lower estimates of earlier studies of employer provided training.

Relative to the early study of ETP, the current findings show similar patterns of earnings gains for the Retrainees relative to the Control Group but different patterns between Retrainee completers and dropouts. The reader is cautioned that the previous study is not quite comparable to the current analysis. In the previous study earnings and UI claims were analyzed only for the subgroup found in the 4th quarter before and the 4th quarter after training (rather than the –4, +4, +8 quarters in the current analysis).

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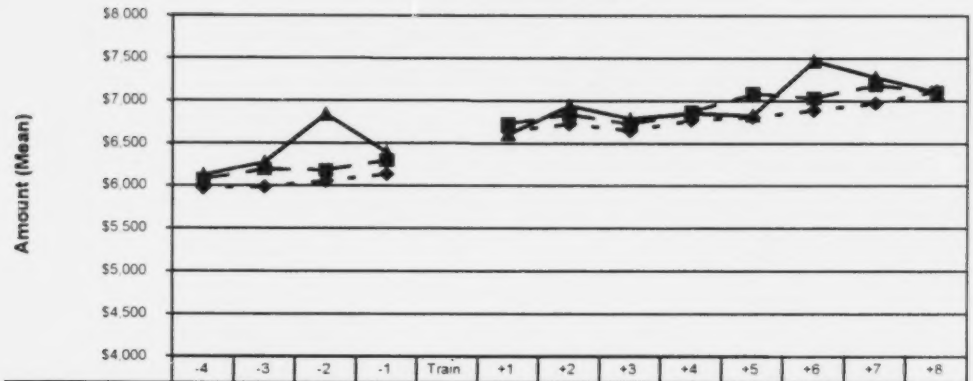
Retrainee completers had larger gains in earnings compared to controls in this analysis than in the previous ETP study. Current Retrainee completers gained $1,100 more in earnings than the Controls, between the year before and the year after training while the differential gain was $800 in the previous study. (Retrainee completers gained $300 while Controls lost $500).

A major difference between the two studies is the experience of the Retrainee dropouts. The previous study, done in the midst of a recession, showed that Retrainee completers had a small gain of just $300, while dropouts had a severe decline of $2,600. Perhaps now, in a prosperous economy, dropouts have better options than they had during slower economic times so that the gap between completers and dropouts is smaller. Research also suggests that current projects that generate a larger number of dropouts are often those where companies become too busy meeting customer demand to complete training (Ong, et. al. 1999). Thus, one reason for the strong performance of dropouts may be that many are found in companies who are very busy and are working overtime or receiving pay increases due to their companies' success. An other interpretation could be that training is having a positive effect on dropout's earnings. ETP does not enroll trainees until they complete at least 20% of the training. Hence each dropout received at least 20% of the training and perhaps much more. Indeed some trainees would have received all the training and not completed the required 90 day retention period. Hence some of the increase in dropout earning may be due to training.

One additional intriguing piece of evidence is that Retrainee dropouts earned about $600 more than completers did in the year before training. In past studies, dropouts tended to earn substantially less than completers did before training. This may indicate dropouts are actually coming from more successful companies where earnings are higher.
The actual amount the Retrainees earned is also revealing. As Figure 9 shows, Retrainee completers and dropouts both earned around $24,000 in the year before training, with dropouts earning a little more. Both groups earned less than the Controls, who averaged around $26,000. The higher earnings of the Control group may reflect the fact that this randomly selected group of workers from similar industries includes managers, engineers, and other well-paid workers while ETP projects are designed to serve frontline workers who tend to be hourly employees with less than a college education.

Figure 11 - Retrainee Quarterly Earnings



	-4	-3	-2	-1	Train	+1	+2	+3	+4	+5	+6	+7	+8
Completers	$5,974	$5,987	$6,055	$6,139		$6,637	$6,727	$6,646	$6,771	$6,605	$6,887	$6,971	$7,117
Drops	$6,077	$6,196	$6,186	$6,301		$6,726	$6,842	$6,719	$6,864	$7,085	$7,030	$7,187	$7,107
Controls	$6,128	$6,277	$6,842	$6,394		$6,604	$6,940	$6,787	$6,852	$6,825	$7,467	$7,274	$7,101

Quarter

A second dramatic difference, between the earlier (1991-92) Retrainees and the current Retrainees, is the difference in the amount of earnings. In the earlier study both completers and dropouts had earnings of almost $30,000 before training. The current group averages around $24,000, a decline of $6,000. This shift is probably due to several factors. Two prominent factors are changes in the industry mix and changes in the types of companies served by ETP. Through its large contracts with training agencies that train in areas such as office automation, ETP is reaching many more lower-skilled employees from smaller companies who pay less.

Finally, we examine the pattern of earnings changes over the twelve quarters studied for all the groups as illustrated in Figure 10. As the graph indicates, all three groups had steadily rising earnings over the period studied. All three of the groups ended up earning about $1,000 more per quarter in the 8th quarter after training than they did in the 4th quarter before training, with training completers having slightly larger gains.

✓ **New Hires: Change in Earnings**

Patterns for New Hires were substantially different than those for Retrainees. Recall that New Hires differ from Retrainees in that New Hires do not have jobs when they begin training; this factor seems to affect the earnings outcomes. Both New Hire completers and dropouts as well as Controls showed increased earnings for both years after training as Table 3 below indicates. Completers gained slightly over $2,700 in the year after training, while, surprisingly, dropouts had slightly larger gains of over $2,900. These results may indicate that in a healthy economy New Hire trainees drop out of training to take other well-paid job opportunities, not available in less prosperous times. We also conjecture that in a prosperous economy the trainees with the fewest opportunities persist through to complete ETP New Hire training. Controls had much smaller gains than either trainee group, only about $1,500. By the end of the second year of training the gaps narrowed substantially. Completers and dropouts both earned more, but now

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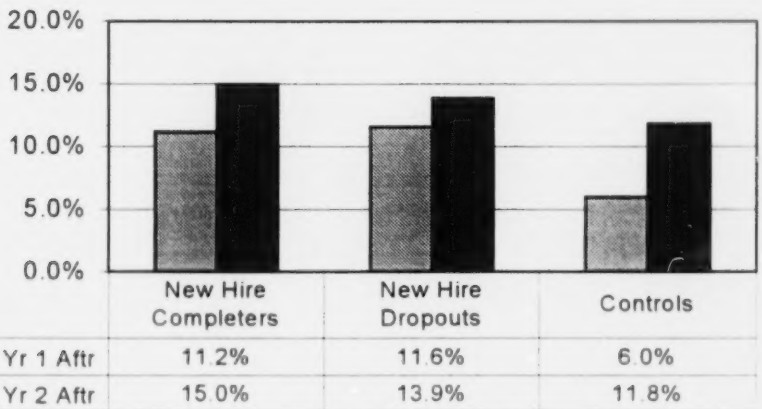
completers show slightly larger increases than dropouts, $3,660 compared to $3,537, while gains for Controls rose to slightly more than $3,000.

Table 3
New Hire Change in Annual Earnings

Group	Change Year Before to Year 1 After		Change Year Before to Year 2 After	
	$ Change	% Change	$ Change	% Change
New Hire Completers	$2,733	11.2%	$3,660	15.0%
New Hire Dropouts	$2,954	11.6%	$3,537	13.9%
Controls	$1,541	6.0%	$3,025	11.8%

Figure 12 - New Hires Percent Change in Annual Earnings - Retrainees



In summary, the New Hire completers' earnings rose $1,200 more than the Controls' earnings from the year before to year after training, and rose $600 more than the Controls two years after training. New Hire dropouts' earnings rose $1,400 more than the Controls' earnings from the year for to after, and $500 more than the Controls' earnings two years after training.

The current pattern of the New Hire completers' earnings relative to Controls' earnings is similar to the previous one but the differences are not as large. In the previous study, New Hire completers gained $3,000 from the year before to the year after training compared to the Controls; in the current analysis the difference is $1,200. Though the current change in earnings for the New Hire completers is smaller than it was in the previous ETP study, it compares very favorably with the results of other studies of displaced workers reviewed earlier.

Figure 13 - New Hires
Annual Earnings

	Completers	Drops	Controls
Year Before Training	$24,397	$25,401	$25,642
Year After Training	$27,130	$28,355	$27,183
2 Years After Training	$28,057	$28,938	$28,667

Groups

The New Hire dropouts had a completely different experience than that reported in the earlier study. In the current study, the New Hire dropouts gained $1,400 from the year before to year after training, compared to a loss of $2,300 in the previous study. To the extent that the difference between the earnings change for a New Hire completer relative to a New Hire dropout approximates the value of completing training, it clearly shows that it is worthwhile to complete training in a recession, while the value is much less in an economic expansion. The 1991-92 New Hire completer had earnings *gains* of over $2,500 while New Hire dropouts had earnings declines of $2,300 for a difference of $4,800. In the earlier, more difficult economic environment the value of completing New Hire training was substantial, while in the recent, more prosperous times the value of completing was small, ($100 in annual earnings at the end of the second year). This small difference was probably due to the many other good alternatives offered by the labor market.

Another interesting pattern is that, unlike the Retrainees who earned less than similar trainees in the 1991-92 cohort, these New Hires earned substantially more than the 1991-92 New Hires both before and after training. The current New Hire completers earned about $24,400 before training and $27,130 after training, putting them roughly on a par with the current Retrainees. In 1991-92, New Hire completers earned only $14,200 before training and about $16,900 after, a difference of $10,000. These differences are principally due to the fact that current New Hires were unemployed much less both before and after training.

Another dramatically different pattern is that in the past study New Hire Completers earned almost $3,000 more than dropouts before training. In this current cohort, the pattern is reversed and dropouts earn $1,000 more than completers before training. This lends support for the notion that dropouts may in fact, be somehow better qualified than completers in the current cohort, while the opposite was true in the past.

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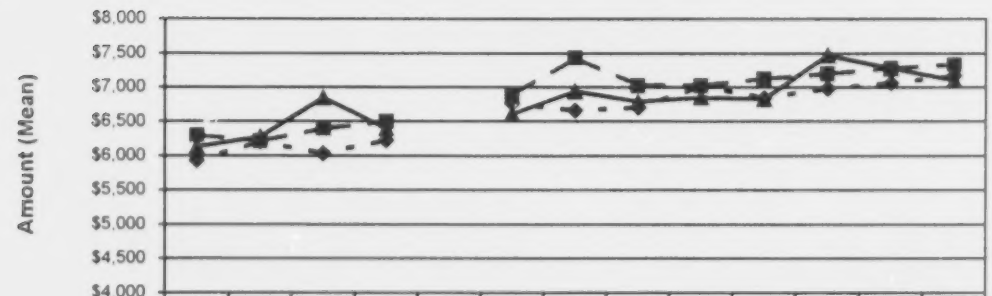
Looking at the quarter-by-quarter earning patterns of all three groups, we see that completers consistently earn less than either the Controls or the dropouts in the year before training. After training, all groups experience steady increases in earnings and the gap between the groups tends to narrow over the eight follow-up quarters. Completers, dropouts, and Controls all ended up earning about $1,000 more in the 8th quarter after training than in the 4th quarter before training, with completers making slightly larger gains than the other groups.

Figure 14 - New Hires
Quarterly Earnings



	-4	-3	-2	-1	Train	+1	+2	+3	+4	+5	+6	+7	+8
Completers	$5,932	$6,204	$6,035	$6,227		$6,758	$6,657	$6,704	$7,011	$6,848	$6,982	$7,058	$7,169
Drops	$6,298	$6,210	$6,395	$6,498		$6,873	$7,434	$7,025	$7,023	$7,125	$7,198	$7,280	$7,334
Controls	$6,128	$6,277	$6,842	$6,394		$6,604	$6,940	$6,787	$6,852	$6,825	$7,467	$7,274	$7,101

Quarter

✓ **Retrainees: Change in UI Claims**

Both Retrainee completers and dropouts were unemployed substantially more than the Controls before training, and then were unemployed substantially less than Controls after training. Specifically, Retrainee completers experienced a drop of 0.68 in average annual weeks of UI claimed from the year before training at (1.84 weeks) to the first year after training (at 1.16 weeks). Retrainee dropouts were similarly unemployed 1.82 before training, falling to 1.16 weeks after training. This compared with only a 0.11-week drop for the Control Group, who started at 1.35 weeks in the year before training, and dropped to an average of 1.24 weeks in the second year after training.

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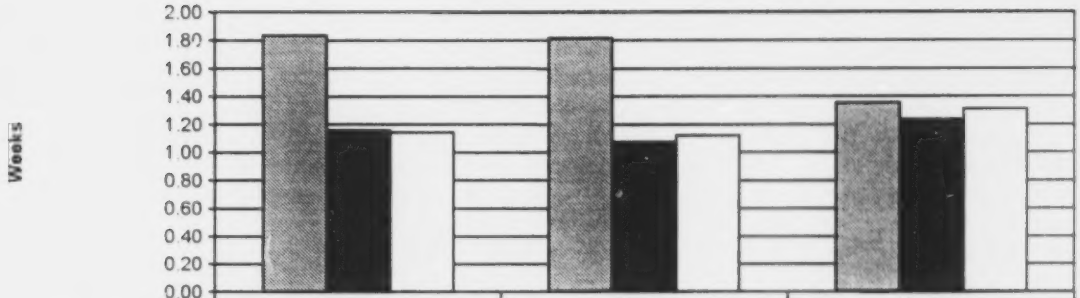
Figure 15 - Retrainees
Annual Weeks of Unemployment



	Completers	Drops	Controls
Year Before Training	1.84	1.82	1.35
Year After Training	1.16	1.07	1.24
2 Years After Training	1.15	1.12	1.31

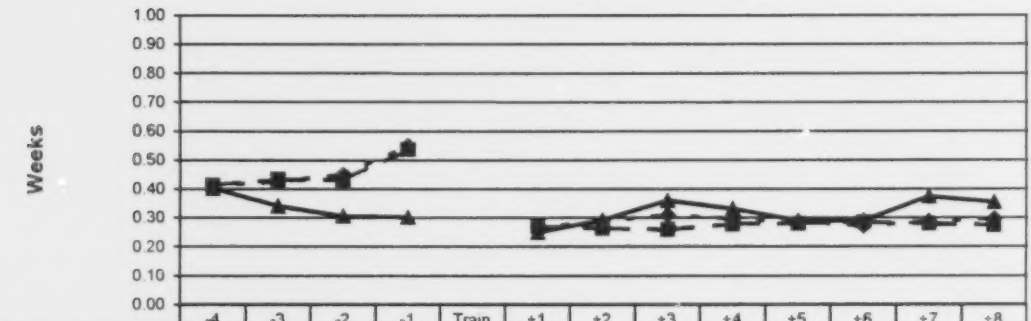
Groups

The reduced levels of unemployment persisted into the second year, with average unemployment remaining virtually the same for both completers (1.15) and dropouts (1.12), while unemployment for the Controls rose slightly to 1.31 weeks.

Again, the annual pattern here is essentially the same as the case of the 1991-92 cohort, except that the economic environments were very different. In the earlier study, both Retrainee completers and dropouts had increases in the weeks unemployed after training. That pattern was due to the recession, which was worsening in California at that time (unemployment rose from 5.5% to 7.7% during the study period). In the current study the economy and jobs were expanding and unemployment was falling, and the before-to-after weeks of unemployment of the Retrainee completers fell by about .6 weeks relative to the Controls (a .68 week decline for Retrainee completers relative to a .11 for Controls). In the previous study, the weeks of unemployment were rising for both groups but the weeks of unemployment for the Retrainee completers rose .8 weeks less than for the Controls (a 1.6-week rise for Retrainee completers versus a 2.4-week rise for Controls).

The data quarter-by-quarter unemployment data in the Figure 14 below shows a more divergent pattern. Unemployment for Retrainees, (both completers and dropouts) rose prior to training while unemployment for the Controls fell. After training the level of unemployment was lower and largely steady for Retrainees, while it varies substantially quarter-by-quarter for the Controls and is higher than either group of Retrainees.

Figure 16 - Retrainees
Quarterly UI Weeks

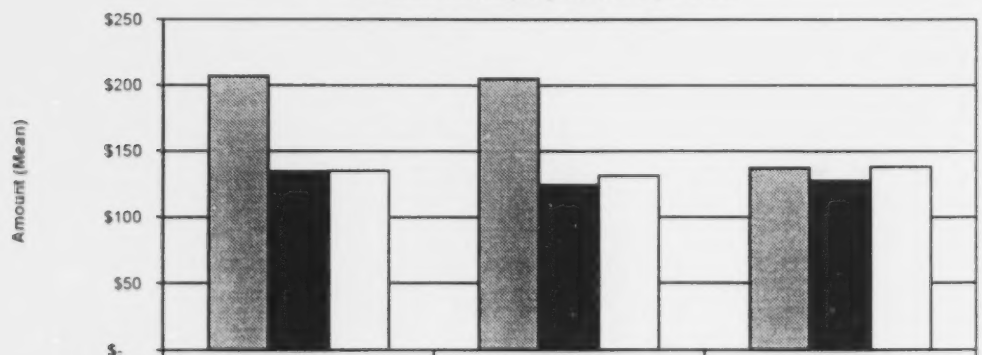


	-4	-3	-2	-1	Train	+1	+2	+3	+4	+5	+6	+7	+8
Completers	0.41	0.43	0.45	0.55		0.27	0.29	0.31	0.30	0.29	0.27	0.29	0.30
Drops	0.41	0.43	0.43	0.54		0.27	0.26	0.26	0.28	0.28	0.29	0.28	0.27
Controls	0.40	0.34	0.31	0.30		0.25	0.29	0.36	0.33	0.29	0.29	0.37	0.36

Quarter

UI payment data amounts mirror the pattern of weeks UI was claimed. Retrainees begin in the year before training by collecting more in UI payments, about $200, than Controls about $140. In the years after training both Retrainee completers and dropouts collect less in payments. Payments to completers fall $71 on average and dropouts $81. This compares to a decline of only $9 for Controls. It is interesting to note that dropouts have slightly larger declines than completers do. Perhaps this indicates, as noted before, that dropouts failed to complete training not because they lost their job but because their companies got particularly busy, or they voluntarily changed to another job.

Figure 17 - Retrainees
Annual Unemployment Payments

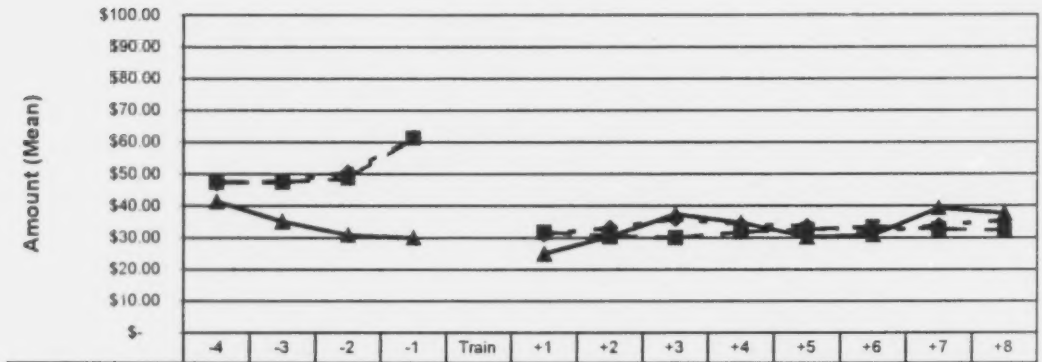


	Completers	Drops	Controls
Year Before Training	$207	$205	$137
Year After Training	$134	$124	$128
2 Years After Training	$135	$131	$138

Groups

The quarter by quarter analysis shows the now familiar pattern of payment rising for Retrainees before training, falling and then remaining mostly constant. Conversely the Control Group has a brief decline after the training period and then varies quarter-to-quarter.

Figure 18 - Retrainees
Quarterly UI Payments



	-4	-3	-2	-1	Train	+1	+2	+3	+4	+5	+6	+7	+8
Completers	$47.14	$47.84	$50.58	$61.45		$31.13	$33.19	$35.89	$34.24	$33.69	$31.73	$33.92	$35.45
Drops	$47.52	$47.47	$48.65	$61.30		$31.76	$30.59	$29.90	$31.76	$32.58	$33.45	$32.72	$32.29
Controls	$41.43	$35.10	$30.85	$29.97		$24.99	$30.37	$37.43	$34.71	$30.22	$30.83	$39.35	$37.72

Quarter

✓ **New Hires: Changes in UI Claims**

New Hires follow a similar pattern to the Retrainees. New Hire completers are unemployed about 1.93 weeks in the year before training. Unemployment falls to 1.09 weeks in the year after training and remains near there in year two. New Hire dropouts are unemployed slightly less before training. Their annual unemployment also falls to about 1.15 weeks in the year after training and remains there in the second year. In contrast, the Controls are unemployed less the year before training (1.35 weeks). They have only a small decline in the after-training period and end up unemployed more than the New Hires the years after training. From the year before training to two years after training, the New Hire completers unemployment drops by almost one week and dropouts' unemployment falls about two-thirds of a week, while the Controls remain about the same.

In contrast, the 1991-92 cohort of New Hires had much higher levels of unemployment before training, about 10 weeks. After training, unemployment fell by 5 weeks for completers and remained about the same for dropouts.

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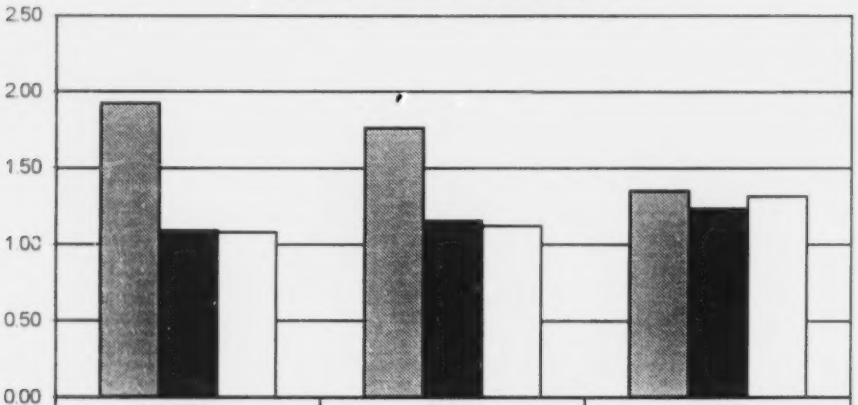
Figure 19 - New Hires
Annual Weeks of Unemployment

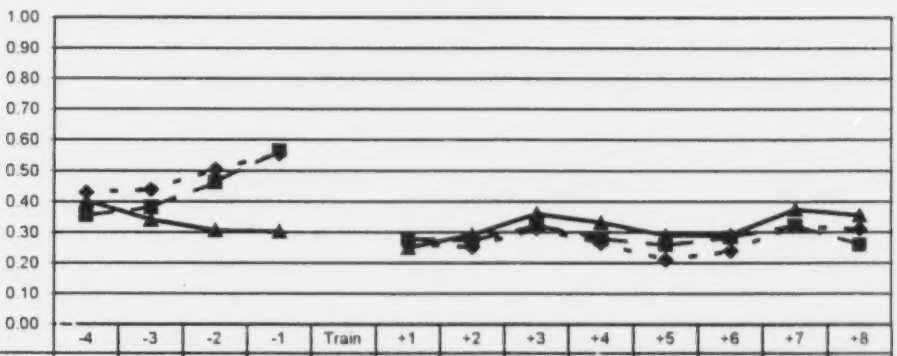


	Completers	Drops	Controls
Year Before Training	1.93	1.76	1.35
Year After Training	1.09	1.15	1.24
2 Years After Training	1.08	1.12	1.31

Groups

An examination of the quarter-by-quarter trends for the current cohort of New Hires shows very different patterns for the New Hires and the Controls. As expected, the New Hires were experiencing a rapid rise in unemployment prior to training. In comparison, unemployment for the Controls was declining. This pattern makes sense given that trainees must be unemployed when they enter New Hire training. After training, the level of unemployment falls for both New Hire completers and dropouts, and remains slightly below the level of the Control Group. Completers are consistently unemployed slightly less than dropouts are.

Figure 20 - New Hires
UI Weeks By Quarter

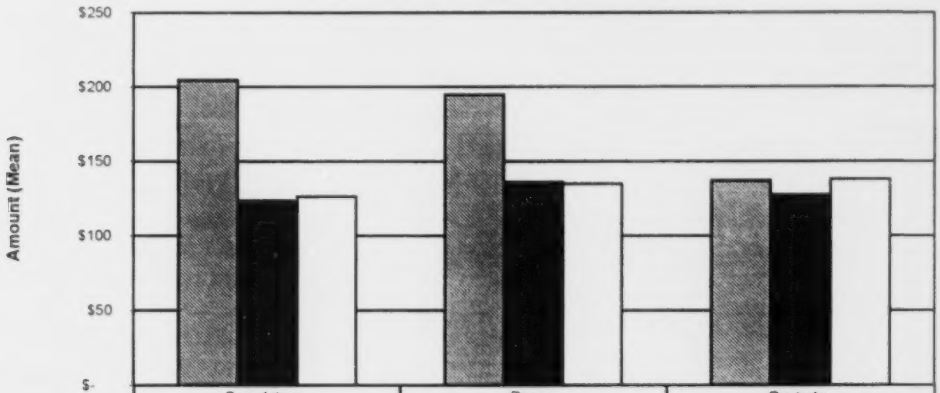


	-4	-3	-2	-1	Train	+1	+2	+3	+4	+5	+6	+7	+8
Completers	0.43	0.44	0.50	0.55		0.26	0.25	0.31	0.27	0.21	0.24	0.32	0.31
Drops	0.35	0.38	0.46	0.57		0.28	0.27	0.32	0.28	0.26	0.28	0.32	0.26
Controls	0.40	0.34	0.31	0.30		0.25	0.29	0.36	0.33	0.29	0.29	0.37	0.36

Quarter

New Hire trainees' UI payments reflect their weeks of unemployment experience. UI Payments, from the year before to the year after training, fell more for the completers ($82) than the dropouts ($59). This compared favorably with Controls who only had declines of $9. The low levels of UI payment persisted through the second follow-up year for the New Hires while the Controls edged upward.

Figure 21 - New Hires
Annual Unemployment Payments



	Completers	Drops	Controls
Year Before Training	$205	$195	$137
Year After Training	$124	$136	$128
2 Years After Training	$127	$135	$138

Groups

The quarter-by-quarter analysis shows that after rising steeply above the level of the Controls before training UI payments fell to about the same level as Controls after training. Payments to completers remain below dropouts for almost all of the follow-up period, and then converged in the last two quarters. This pattern indicates that the benefits of completing training are strongest in the year or so after training.

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- **Employment Stability**

  ✓ **Overview**

Part of ETP's mission is to create "secure employment" for California workers. To see if ETP is achieving this goal we measured the employment stability of the workers in our two-year cohort of ETP trainees found in the year before and first and second year after training. For both Retrainees and New Hires, we wanted to determine whether they had more or less stable employment after training. To do this we constructed an "employment instability index." The index combined data on unemployment and whether or not a trainee remained within the same industry. Index scores for ETP trainees, both dropouts and completers, were compared with scores from similar workers in the control group to estimate the impact of ETP training.

  ✓ **Method**

An employment instability index was constructed in the following way:

> The average number of weeks of unemployment in a given quarter in the year before and after training was computed for each of the five groups (Retrainee completers and dropouts, New Hire completers and dropouts, and controls).

> The average number of industry changes, as reflected by a changing SIC for the primary employer, was computed for each of the five groups.

> A ratio was computed for each ETP group, dividing each ETP value by the corresponding Control value (e.g., Retrainee Complete Average Weeks of Unemployment divided by Control Average Weeks of Unemployment, for corresponding quarters).

> The mean ratio was computed (add the unemployment and industry change ratios, divide by two) and this is the "quarterly instability index." If the index equals one, then the ETP group is the same in stability as the Control group. If the index exceeds one, then the ETP group is less stable, and if the index is below one, then the ETP group is more stable.

  ✓ **Results**

The graph below shows that Retrainee completers had more stable employment after training than either the control group or the Retrainee dropouts. Similarly New Hire completers had more stable employment than either the control group or New Hire dropouts.

As the graph below indicates, in the year prior to training, we see instability increasing for all groups. It increases most dramatically for New Hires, which makes sense considering that they must be unemployed to eligible for the program. However if we look at the entire year before training, the Retrainee dropouts are indistinguishable from the control group (Average index, 1.01), but the Retrainee completers are more stable (Average index, .90). The New Hire

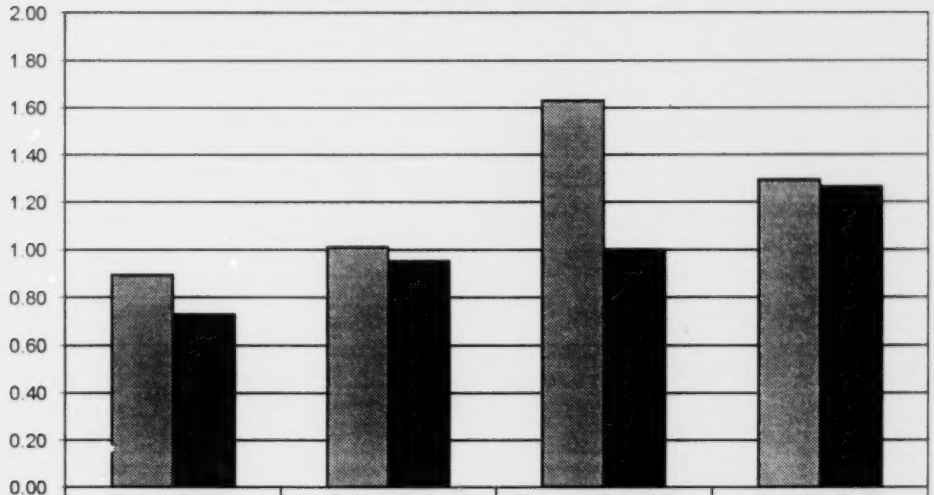
dropouts had much higher instability than the controls (Average index, 1.30). Interestingly, the New Hire completers were substantially higher than the controls and the dropouts (Average index, 1.63).

Looking at index scores in the year following the training, the Retrainee completers are significantly more stable (Average index, 73) than both their pretraining values and the controls. The Retrainee dropouts on the other hand, have only a small improvement in stability and remained close to the control group (Average index, 95%). The New Hire dropouts show a very slight increase in stability and remain substantially above the controls (Average index, 1.27). New Hire completers show a dramatic increase in stability going from an index of 1.63 before training to 1.00 after training. Indicating that that their experience is now the same as the control group.

Looking at the quarter-to-quarter changes that underlie the annual changes, we see the instability was rising for all ETP trainees before training. It declines dramatically immediately after training and continues to decline for two more quarters, before beginning to rise. By fourth quarter after training Retrainee completers, Retrainee drops and New Hire completers have begun to converge, while New Hire drops remain far less stable than other trainees.

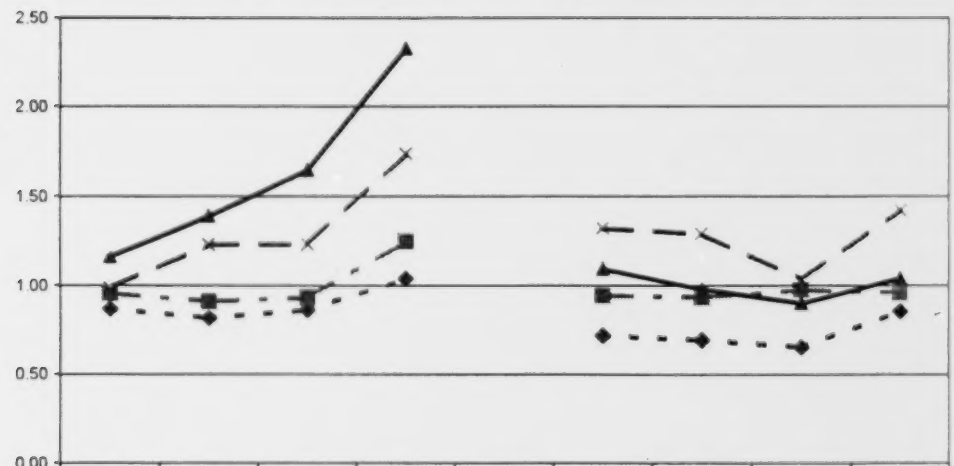
Clearly, completing training has positive impact, particularly on those New Hires who had the least stable experience prior to training. The increased stability that comes from completing training appears to persist for at least the entire first year after training for both New Hire and Retrainee completers. Conversely those who dropped out of training saw little improvement in stability in the year after training. New Hire dropouts remained much worse off than the control group and Retrainee drops continued to have an experience very close to the control group.

Figure 23 - Employment Instability
Year Before and After Training



	Retrain Comp	Retrain Drop	New Hire Complete	New Hire Drop
Yr Before Training	0.90	1.01	1.63	1.30
Yr After Training	0.73	0.95	1.00	1.27

Figure 24 - Employment Instability by Quarter



	-4	-3	-2	-1	Training	1	2	3	4
Retrain Comp	0.87	0.82	0.86	1.04		0.72	0.69	0.65	0.85
*Retrain Drop	0.95	0.91	0.93	1.25		0.94	0.93	0.97	0.96
NH Comp	1.16	1.39	1.65	2.33		1.09	0.98	0.90	1.04
*NH Drop	0.99	1.23	1.23	1.74		1.32	1.29	1.03	1.43

Quarter

- **Regression Analyses**

  - ✓ **Methodology**

The regression analyses were designed to detect any systematic relationships between changes in trainee earnings and demographic variables (age, experience, education, gender, and so forth) or programmatic variables (size or type of business, type of training, type of training contractor, and so forth). Knowledge of any systematic positive or negative effects of these trainee or contractor characteristics on changes in trainee earnings could be helpful in developing more efficient or effective training policies.

In our search for insightful relationships between earnings changes and the demographic and programmatic variables, we investigated several alternative formulations of these relationships. The constant aspect of our analysis was that Retrainees and the New Hires were always investigated in separate regression analyses because of the very different nature of the trainees and their circumstances. This allowed the relationships between earnings change and the demographic and program variables to be different in magnitude and significance for Retrainees versus the New Hires. Had we forced these two groups of trainees into a single equation, all of the quantitative relationships between earnings change and the other variables would have had the same magnitude and statistical significance.

The demographic variables investigated included

- age,
- education,
- gender,
- ethnicity,
- marital status,
- whether the trainee was a veteran, and
- whether the trainee was handicapped.

The programmatic variables included

- whether the trainee completed training,
- the type of training,
- the type of trainer,
- the hours spent in classrooms, in laboratories, and in SOST,
- the size of the business,
- the type of industry, and
- whether the training was related to an apprentice program, and
- whether the training was related to the GAIN program.

Our regression model was designed to uncover any systematic relationship between these independent variables and the trainees' before-to-after training change in earnings.

We also measured the change in earnings two different ways. First, we used the dollar change from the year before training to the year after training. The second measure was the industry-adjusted change in earnings, which was the dollar change in earnings for the trainee minus the

average dollar change in earnings for the members of the Control Group in the same industry group.

We used several types of regression equation formulations to search for these systematic relationships. For example, we investigated the nature of the relationship between the type of training contractor and earnings change both as additive effects within one regression equation and in separate regression equations that allowed different effects between type of contractor, earnings change, and all other variables. We also used regression analysis techniques designed to help detect significant relationships in cases where there are many potential relationships. One technique was a step-wise regression that effectively searched the relationship between earnings change and the other variable for the most strongly related variable, then repeated the process for the next most strongly related variable, and so forth. We applied other analytical techniques like this one in our search for related influential demographic and programmatic characteristics. Some of our analytical techniques involved dropping variables from the analysis that had severe data omission problems to determine whether the remaining variables had significant relationships to earnings changes. The full regression equations with the all of the variables specified appear in Appendix B.

✓ The Data

We encountered severe data problems in our analysis. The data files for the New Hire trainees were so riddled with missing data that we could not use 80% of the New Hire records in the fully specified regression analysis. That is, out of 4,336 trainee records, we had to delete 3,462 from this analysis due to missing data, using only 874 records in our search for statistically significant relationships. The Retrainee records fared only somewhat better in the final analysis, with only 45% of the records discarded because of missing data (23,837 out of 53,121).

This sad record of data usability occurred even after a major data cleanup effort in which ETP personnel searched old files for missing and incorrect data entries on trainee records (some records were archived and thus not readily available). In one critical data field, the employer ID tax code—which allows the linkage between three critical databases: 1) the individual earnings and UI claims records, 2) the company and contract characteristics, and 3) the individual trainee—we corrected well over 4,000 incorrect and missing entries. In another less critical (but still important) data field we compared the Business Size codes listed in the Contract Database with those listed in the Trainee Files. We found disagreement between 10,818 codes out of a total of 37,127 records in the 94-95 file. The disagreements included 5,521 records where no business size was coded. In the 95-96 file we found disagreement between 4,719 cases in the contracts (out of 20,346 total records) with 2,626 of those showing no business size code. These are very large error and omission rates.

While we were able to discover and enter or re-enter many correct codes with a great deal of time and effort, our ability to discover erroneous entries was limited to areas where two databases contained similar information allowing cross-checking. Most of the data fields did not allow cross-checking so undoubtedly many entry errors went uncorrected. Furthermore, there was no alternative source for most missing data, so those data were unavailable for the analysis. Unfortunately, the large error and omission rate affected the regression analysis results.

It is not clear why the data records are in such bad shape for the trainees in the current study period. In the a previous study of ETP involving the 1990-91 trainees, we were able to use 89.7% of the Retrainee records (16,249 out of 18,118) and 93.5% of the New Hire records in the regression analysis. In the current study we were able to use only 55.9% of the Retrainee records, and only 20.5% of the New Hire records in the regression analyses (Moore, Blake & Phillips, 1995).

✓ The Findings

Our findings were disappointing. Our specified regression equation could only explain 1% to 8% of the total variation in earnings change among the trainees (this explanatory power is measured by the r-squared of the regression). While regression analyses of cross-sectional data like these typically have low explanatory power because of variations caused by factors not captured in the regression equation (earnings history, personal characteristics, quality of training and education, and so forth), the explanatory power of these regressions are very low even by cross-sectional standards. Regressions with r-squares in the 20% to 40% or more range would be much more significant in that they would contain some variables that explained some significant portion of the observed variation.

The poor performance of these regression equations can probably by attributed to the data quality problems. When as much as 80% of the observations have to be discarded because of missing data, the tighter statistical distributions associated with the law of large numbers and other statistical tendencies have little opportunity to take effect. The results are wide variations among the remaining data and low statistical significance for means and other statistical measures. The types of errors found also introduced wide variations in the data. For example, in most cases the trainees in a single company would code company size at least three different sizes out of the four available categories (1-50 employees, 51-100, 101-250, or more than 251). Another variation was introduced by changing the coding scheme for education level during the study period. For part of the period there was no code for having completed some high school (more than eighth grade but not a high school graduate). These kinds of variation-inducing errors and omissions reduce the explanatory power of any regression equation and decrease the statistical significance of any examined variable. The results of this analysis are a case in point.

We did find a statistically significant result in one of our regression equations. This result derived from a statistically significant constant term in one of our Retrainee regression equations on industry-adjusted earnings change. Retrainees experienced annual earnings growth of $957 more than the average in their industry from before to after training. Notably, it did not matter whether the particular trainee completed training, because the regression coefficient corresponding to completing training was statistically insignificant in this and other regression equations. This means that Retrainee dropouts experienced the same earnings boost relative to their industry cohorts that the Retrainee completers did. This result is consistent with the results reported earlier in this study.

We did find three statistically significant coefficients in one of the reduced regression formulations for New Hires. Unfortunately two of these coefficients were associated with the

educational variable which had been variously coded, and the other was associated with business size which also had been unreliably codes. Given that over 75% of the observations had to be deleted because of missing data even for this reduced equation, we have no confidence that these results provide any insight into New Hire training relationships.

The Economic Impact of ETP Training

The impact of ETP training on the California economy is the difference between what did occur in the California economy with ETP training programs in place and what would have occurred in their absence. ETP's impact on the California economy is estimated at over $400 million in the first year after training. This estimate is based on the impact training provided by ETP in 1994-95 and 1995-96. ETP funds invested to achieve this estimated economic return equalled $73.3 million which is the total amount earned in contracts which completed in those two years.

The economic benefits of these two years of training derive from the outcomes of training. Below, we identify several training outcomes and their economic benefits they generate. For the reader's convenience we have summarized the estimated magnitude of those benefits for the California economy at the outset. The several sections that follow explain why those benefits are expected and carefully detail their empirical derivation. In each case we have been careful to include only net benefits to California, and to exclude a benefit to one California worker or company that appears to come at the expense of another California worker or company.

- **The Training Outcomes and Their Economic Benefits**

The benefits of training for the trainees can lead to economic benefits for the California economy. For example, training that increases employment stability will reduce UI claims by workers, and training that increases productivity will increase workers' earnings and may spawn other economic activity in the state. The three types of ETP training outcomes with their main types of economic benefits are listed below. The benefits are estimated for the first year after training and are rounded to the nearest million dollars.

Training Outcomes	Estimated Benefits
1. Increased employment stability for trainees	
✓ Unemployment Insurance fund savings	$2 million
2. Increased productivity of trainees	
✓ Increased trainee earnings	$33 million
✓ Increased sales by other California businesses	$17 million
3. Saving California jobs	
✓ Unemployment Insurance fund savings	$61 million
✓ Prevented temporary earnings losses by trainees	$167 million
✓ Prevented losses by other California businesses	$134 million

The outcomes the ETP training and their benefits for the California economy are summarized in Table 4. We estimate that ETP training during the two-year study period had an impact of approximately $414 million to the California economy in the first year after the training took place. The largest component of these benefits resulted from the ETP training outcome of saving jobs that were threatened by out-of-state competitors. This training outcome produced over $360 million in benefits and entailed UI Fund saving, trainee earnings savings, and indirect (or multiplier) impacts, with the largest component being the impact on earnings saved in basic industries. The second largest benefit was associated with the productivity increases resulting

from ETP training. These benefits totaled nearly $50 million, with the direct impact of productivity increases on workers at almost $33 million and the indirect impact equal to about half of that, at $16.8 million. The smallest training outcome benefit was derived from increased employment stability which saved UI Funds over $2 million in the first year after training.

Table 4
ETP Impact on the California Economy Summary

Outcome / Benefit	UI Fund Savings	Earnings Impact	Indirect Effects	Total
Employment Stability	$2,030,000	NC	NC	$2,030,000
Productivity Increase	NE	$32,815,000	$16,766,000	$49,581,000
California Jobs Saved	$61,115,000	$167,305,000	$133,845,000	$362,265,000
Total	$63,145,000	$200,120,000	$150,611,000	**$413,876,000**

Table notes:

NC: Not calculated separately. Increased employment stability would lead to higher earnings for trainees due to less unemployment during the first year after training. We did not net this number out of the productivity increase estimated for the Retrainees, so any effect of increased employment stability for Retrainees is included in the productivity increase and indirect effects estimates. Any effects for New Hires are arguable because the training qualifies them for more stable jobs that are already available.

NE: Not Estimated. Since UI taxes apply only to the first $7,000 of calendar year earnings and the productivity increase boosts earnings that already average around $25,000 annually, any effect of the productivity increase on increasing UI funds would be both small and difficult to estimate.

Another way to read Table 4 is in terms of the type of benefit from ETP training. For example, UI Fund savings resulted from both increased employment stability and from saved jobs, and total over $63,000,000. ETP's impact on earnings totals over $200,000,000 in the first year after training and is derived from both increased productivity and saving basic jobs. The indirect effects of ETP training on the California economy in the first year after training added up to over $150,000,000 and resulted mainly from saving basic jobs and secondarily, from increasing productivity in basic jobs. These estimated indirect effects may be subject to some cynicism largely because indirect or multiplier effects are often claimed with little logical justification and even less empirical basis for the multipliers used. However, the multiplier effects claimed here have been carefully justified and meticulously tracked and estimated. Further evidence of the existence of these effects is found in the section on the impact of ETP training on companies. In that section, companies with ETP training programs were shown to have grown faster than similar-sized companies in their industry. It is logical that as these ETP contracting companies which grow faster, also order more from their California suppliers, which then generate the indirect or multiplier effects.

Next we show the analyses that lead to values reported above.

- **Outcome 1: Increased Employment Stability—Approximately $2 million**

A major goal of ETP is to provide workers with "secure employment." Achievement of this goal can be measured by the reduction in their unemployment claims and by the lower UI payments distributed to them. As shown in Figures 13 and 17 in the previous section, ETP New Hires and Retrainees both experienced lower rates of unemployment (as measured by average UI weeks claimed) after training, relative to before. The improving economy during the study period

produced lower unemployment for the Control Group as well, but trainee claims rate fell significantly relative to the Controls. UI fund savings result from the lower UI claims associated with lower post-training unemployment rates for the trainees.

We estimated the reduced UI payments made to trainees as a result of ETP training by tracking the unemployment and UI claim experience of the Retrainee and New Hire completers compared to that of the Control Group. Because we were interested in estimating the total UI payments savings associated with ETP training, we tracked the experience of all trainees relative to all Controls. (That is, we did not restrict the analysis to a subset of the trainees who were in the labor force in certain quarters before or after training, nor to Controls who were in the labor force in similar quarters.) Our analytical procedure involved first determining what percentage of trainees would have experienced unemployment had they not been trained. Then we compared that percentage to the completers' actual post-training unemployment, and applied the trainees' UI payment rate to the estimated difference in unemployment rates for the trainees and the Controls.

We used the experience of the Control Group[4] to estimate the percentage of Retrainees and New Hire completers who would have experienced unemployment. However, we could not simply apply the unemployment percentages for the Control Group to the trainees because ETP contracts have selective requirements that imply the trainees could be different than the average California workers. ETP contracts require that the New Hire Trainees be out-of-work, and that Retrainee contracts involve workers who are threatened with displacement, or are transitioning to a high-performance workplace, or are in a company that is diversifying its product line. Because of these selective contract requirements, the ETP trainees are not expected to have the same unemployment experience as a random sample of the California workers (the Control Group). What can be expected, though, is that the ETP trainees experience the same trend in unemployment as the Control Group, because that trend is produced by the general conditions and dynamics in the California economy. In short, we assumed that, without training, the New Hires and Retrainee completers would have experienced the same trend in unemployment that the Control Group did. Tables 5 and 6 show the calculations that resulted in the estimates of this source of UI fund savings by ETP training for Retrainees and New Hires respectively.

[4] The Control Group experiences used throughout this analysis are those for the *industry-adjusted* Control Group. That is, the experience of the Control Group in UI claims or earnings or other variables was derived by weighting the Control Group according to the industrial composition of the trainees. This was done by determining the experience of the 25 industry-based subgroups of the Control Group and then weighting those industry-based subgroup data by the proportion of trainees that appeared in the same industry subgroup. This procedure yields a Control Group has the same industrial composition as the trainees.

Table 5
Retrainee Completers' Estimated UI Savings Attributable to Training

Item	Year Before	Year After	Second Year After
Retrainees: Average percentage making quarterly claims	6.82%	5.29%	4.42%
Controls: Average percentage making quarterly claims	7.15%	7.04%	6.43%
Normalization ratio*	.954	.954	.954
Retrainees: Adjusted percentage making quarterly claims	6.82%	6.71%	6.13%
Retrainees: Adjusted claim rate as a percent of actual claim rate	100.00%	126.96%	138.79%
Retrainees: Actual UI claims total payment	$9,303,400	$7,338,217	$6,020,201
Retrainees: Estimated UI payments without training	$9,303,400	$9,316,600	$8,355,437
Retrainees: Estimated UI savings due to training		$1,978,383	$2,335,236

**Note that the normalization ratio is the Retrainees' year-before claims divided by the Controls' year-before claims. Applying this ratio to each of the Controls' claims rate produces the expected claims rate for the Retrainees. The Retrainees' year-before expected claims rate is exactly what it actually was because of the definition of the normalization ratio. The Retrainees' year-after expected claims rate is the Controls' rate times the normalization ratio, which is what the Retrainees would have experienced if their claims rate had followed the same trend as the Controls' did.*

Table 5 details the procedure for estimating the UI savings due to training for the Retrainee completers. The first two rows of the Table report the average quarterly percentage of Retrainees and Controls who made UI claims during the year before and the two years after training. The "normalization ratio" in the third row is a ratio of the average quarterly percentage of retrainees making UI claims to that of the Control Group for the year before training. This is the ratio that was applied to the Control Group "after-training" claims rate to estimate the adjusted claims rate for the Retrainee completers. The result is the fourth row in the Table which shows the estimated quarterly average of UI claims that the Retrainees would have made had they followed the same trend in UI claims as the Control Group did. The Retrainees' after-training adjusted claims rate was then divided by their actual claims rate to obtain the adjusted rate as a percent of the actual rate. This percentage was applied to the actual UI payments to the Retrainee completers to obtain the estimated total UI payments to the Retrainees had they not been trained. The Retrainees' actual UI payments were then subtracted from the adjusted payments to obtain the estimated UI savings due to training for the Retrainee completers. The same procedure was followed for the New Hire completers in Table 6.

Table 6 New Hire Completers' Estimated UI Savings Attributable to Training			
Item	**Year Before**	**Year After**	**Second Year After**
New Hires: Avg percentage quarterly claims	6.52%	5.66%	4.26%
Controls: Avg percentage making quarterly claims	7.15%	7.04%	6.43%
Normalization Ratio	.912	.912	.912
New Hires: Adjusted percentage making quarterly claims	6.52%	6.42%	5.86%
New Hires: Adjusted claim rate as a percent of actual claim rate	100.00%	113.42%	137.74%
New Hires: Actual UI claims total payment	$414,169	$384,504	$280,262
New Hires: Estimated UI without training	$414,169	$436,104	$386,033
New Hires: Estimated UI savings due to training		$51,600	$105,771

** See the note on Table AAA for an explanation of how the normalization ratio is calculated.*

The total UI fund savings associated with the lower UI claims rates of the Retrainee completers and the New Hire completers is estimated to be about $2,030,000 in the first year after training for those trained in the study period. As indicated in the Tables above, we estimated another $2,335,000 in UI fund savings for the second year after training for these same trainees, but this sum is not included in our subsequent calculations since our estimates pertain only to impact of ETP training in the first year after training.

- **Outcome 2a: Productivity Increase and Its Impact on Earnings—Approximately $33 million**

The productivity of ETP trainees may increase either because they produce more per hour worked or because they work more hours in a year. Any training program that increases the marketable skills of the participants creates additional economic capacity to produce. ETP programs may have an advantage over other training programs because of the placement requirement in ETP contracts. Other training programs create the potential to produce more; that potential is realized when the newly trained workers are placed. ETP contracts require placement as a condition of training, so when ETP training is completed the economic potential of the enhanced productivity is realized. Thus, the impact of ETP training is realized immediately in increased output for the California economy, due to the enhanced productivity of the trainees who complete the program. In addition, because trainees gain new skills, they may have the opportunity to work more hours by avoiding periods of unemployment associated with less marketable skills.

Direct measurements of changes in productivity are difficult and expensive. Direct measurement of productivity requires accurate physical output and input data for the periods before and after training. Such data are generally not available, and ETP projects are no exception. Even if those data were available, direct measurement of individual productivity is complicated because newly trained workers typically work with different equipment, different materials, and differently skilled people than they did before training. It is difficult to separate a single worker's change in productivity from the contribution made by the new equipment, new materials, and differently skilled workers.

In this project, as in most studies, the change in earnings is used as an indicator of the change in worker productivity. Standard economic theory implies that workers are paid the value of their contribution to production (their marginal product). Accordingly, an increase in productivity should result in an increase in workers' earnings. The advantage of using earnings as an indicator of productivity is that earnings data are much more available than physical output data and earnings data are reported on an individual basis. Because uniform records of the physical change in production levels do not exist for ETP projects, we used the changes in earnings data as indicators of changes in productivity[5].

Worker productivity can be influenced by a variety of factors other than training. These factors include: investments in capital equipment (new machinery, computers, or software), improvements in infrastructure (usually transportation, utilities, and communications systems), growth in technology, more efficient regulation, or a simple increase in the value that consumers place on the products produced. Thus, to estimate the increase in worker productivity attributable to ETP training, we need to control for the productivity increases due to these other factors. We used the pattern of earnings changes for the Control Group to adjust for the changes—other than ETP training—that could affect trainee productivity.

The increase in productivity attributable to ETP is the difference between the trainees' actual growth in earnings and the growth in earnings that they would have had without ETP training. We used the earnings of the Control Group as an indicator of the average rate of productivity increases for workers who were not in ETP training[6]. Again, since we were trying to capture the total impact of ETP on productivity, we used the experience of all of the trainees and all of the Control Group in these estimations. The results of this analysis are presented in Table 7.

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[5] Some researchers argue that changes in wages underestimates the increase in productivity because some common pay practices (see for example Bishop, 1985). If this is correct then these estimates understate the real impact of ETP training.

[6] Note that this use of earnings of the Control Group would include the productivity effects of the average level of training going on in the California economy because that training would affect the average earnings in the labor force.

Table 7
The Value of the Productivity Increases of ETP Training

Item	Year Before	Year After	Second Year After
Retrainees: Total Earnings	$999,135,817	$1,060,014,095	$1,051,697,931
Percentage Based on Year Before	100.00%	106.09%	105.26%
Control Group Earnings Percentage Based on Year Before	100.00%	102.91%	105.33%
Retrainee's Expected Earnings Based on Control Group Pattern		$1,028,210,670	$1,052,389,756
Retrainees' Excess Earnings Growth		**$31,803,426**	$(691,825)
New Hires: Total Earnings	$47,899,614	$50,303,608	$49,781,648
Percentage Based on Year Before	100.00%	105.02%	103.93%
Control Group Earnings Percentage Based on Year Before	100.00%	102.91%	105.33%
New Hire's Expected Earnings Based on Control Group Pattern		$49,293,493	$50,452,663
New Hires' Excess Earnings Growth		**$1,010,115**	$(671,015)

Table 7 shows the before-to-after earnings patterns for the Retrainee completers and the New Hire completers. These patterns are converted into percentages based on the earnings in the year before training. The next line shows the before-to-after earnings patterns for the Control Group, also in percentages based on the year before. We then multiplied the before-training earnings of the trainees by the Control Group's before-to-after percentage income change to determine what the trainees would have earned had they followed the same earnings trend as the Control Group. Using the Control Group as an indicator of the expected earnings pattern for the trainees, had they not been trained, the difference between the expected pattern and the actual pattern in converted into dollars in the last line. Thus the estimated year-after training increase in productivity, attributable to ETP training, is approximately $32,815,000 for the Retrainee and New Hire completers combined.

We included the estimated second-year-after productivity differential to illustrate a major finding of this analysis. Namely, that the effects of ETP training in a recovering economy appear to be substantially different than in a slowing economy. Table 7 shows that the productivity-enhancing effects of ETP training disappeared in the second year after training in the recovering economy. This result is quite different from the results of the earlier studies of ETP where productivity gains persisted over at least three years. Other studies have suggested that the

training-related productivity gains lasted about 12 years, and the earlier ETP study results were more or less consistent with that result (Lillard and Tan, 1986). Unfortunately, we did not have additional years of data for these trainees so we could not determine whether some of the productivity-enhancing effect of training returned during the third or fourth years after training. We have omitted any projection of the long-term effects of ETP training because of the rough equality between the trainees' and Control Group's earnings growth in the second year after training. Without subsequent years of earnings growth experience for trainees and the Control Group, we are unable to determine whether there is a long-term enhancement of productivity for trainees in an expanding economy with falling unemployment.

- **Outcome 2b: Increased Productivity and Its Multiplier Effects—Approximately $17 million**

ETP training programs have the potential to have an economic impact beyond the direct effects on the program participants and the companies which employ them. These are indirect or "multiplier" effects, and they are transmitted from one company that is experiencing growth to their supplier companies through increased orders. Whether these indirect effects are realized depends on the nature of the companies in which the trainees are placed and the type of trainee. Specifically, for the potential indirect economic impact to be realized, the companies must be in basic industries and the trainees must be Retrainees. We explain the reasons for these conditions after a brief explanation of regional multipliers.

In standard economic theory, regional multipliers are derived from the distinction between "basic" activities and "service sector" activities. The businesses that operate in these competitive national and international markets are the "economic base" of the region's economy. According to the regional theory, these "basic" activities generate the jobs in the "service sector" of the local economy through orders from their local suppliers and through payroll expenditures that generate local household demands. The "services sector" includes all the businesses that are suppliers to locally-situated industry and households, or, put another way, businesses which respond to locally-generated demand for goods and services. Regional theory postulates that variations in the output of the basic industries spawn variations in their local orders and their payroll, which in turn cause variation in the demand for the service sector products. Regional multipliers show the relationship between a change in the output of a basic industry and the output of a region as a whole (basic plus service sector). Basic industries that have a greater proportion of local suppliers and high local payrolls relative to output have larger multipliers. Basic industries that have weaker linkages to the local economy have smaller multipliers.

The service sector is typically identified with local suppliers of large firms, retail trade, local business services, most personal services, and local government activities. In contrast, businesses that supply demands generated outside the local economy are part of the economic base. The economic base encompasses all export-oriented activity and includes: the portion of local hotels, restaurants, entertainment and retail trade that services visitors; governmental activities funded by non-local sources; and interregional financial, insurance, transportation, and utility networks.

The bottom line is that basic industries as those which compete with out-of-state businesses. Whether a particular retraining program has a multiplier effect in the California economy thus depends critically on the location of the competitors of that business. If that company's competitors were located out-of-state then the increased sales for this company and its suppliers would come mainly at the expense of out-of-state firms and suppliers. This would produce a net gain in production and jobs for California. Similarly, if this company lost its competitive position, its lost sales would likely be to have been picked up by out-of-state companies and their suppliers, resulting in a loss of economic activity in California. On the other hand, if a company's competitors were other California businesses then this company's and its suppliers' gains or losses would produce offsetting effects in other California businesses, and yield essentially no net gain or loss for the California economy. For example, a company that manufactures computer printers competes with companies that are out-of-state or in other countries and thus the computer printer manufacturer is in a basic industry. Conversely, a restaurant does not compete with out-of-state restaurants, but with other local restaurants and is thus not in a basic industry.

ETP training that enhances a firm's competitive advantage produces an economic impact beyond the direct effects of ETP on the businesses and the workers. Because ETP retraining programs upgrade both the workers' skills and their jobs, these ETP training strengthens the advantage of California businesses relative to their competitors. To the extent that California businesses with ETP retraining programs gain sales, or preserve sales they would otherwise have lost to out-of-state competitors, this means more production for them and increased sales and jobs for their in-state suppliers. The impact of the retraining programs on the California economy would be the increased production in the businesses with the retraining programs, plus the increased activity of their various suppliers. The aggregate of the increased production of their suppliers is the "indirect effect," of the direct impact on the businesses with retraining programs. This indirect economic impact is called a "ripple or multiplier effect" and it requires that there be no offsetting negative effect on other California suppliers. California's economic environment and the conditions that lead to multiplier effects in the California economy are described below.

California has the largest economy of any state in the nation and is a major trade center for the Pacific Rim. Recent advances in communications and information processing technologies, along with falling transportation costs, have produced keen competition in the markets for nationally and internationally traded commodities and services. Consequently, California businesses that produce, warehouse, transport or sell nationally and internationally traded goods and services face rigorous domestic and international competition.

The simple classification of the firm's industry as either basic or service sector usually determines whether a particular training program will have multiplier effects. However, there are some cases in which retraining programs in the service sector could also have multiplier effects. This would occur in the case where a firm's market consists of local customers but the firm competes with out-of-state producers who also supply this local market. This is the case of "import substitution," when an increase in the firm's output takes place at the expense of imported goods instead of locally-produced goods. If new local production replaces consumer or production goods and services that would have otherwise been imported from outside the region, then this new locally-oriented production generates additional local jobs. In short, this import-

substitution type of service activity can have multiplier effects. If all of the service sector training done by ETP were in businesses which competed with non-California suppliers, then the productivity enhancement in those industries would also be subject to a multiplier effect on local jobs. The multiplier effect accounts for the new economic activity created in the service sector as local suppliers respond to the higher demands from the firm and the community.

The second requirement for ETP training to have indirect or multiplier benefits is that it involves Retrainees. This results from the fact that Retrainee programs involve upgrading jobs as well as workers' skills. By upgrading jobs, businesses gain a competitive edge in the market and therefore will order more goods and services from their suppliers. Our assumption here is that the companies will increase all of their inputs more or less proportionally with the increased productivity of their retrained workers. This means that their orders from local suppliers would rise in proportion to their workers' increased productivity (measured by earnings). An additional effect occurs as the Retrainees become more productive, earn more, and thus spend more in the local economy, generating additional economic activity in that way.

In contrast, ETP New Hire training involves workers who are currently unemployed and require training to qualify for jobs that are already available. An important feature of New Hire training is the presumption that the job is available, and that if the New Hire trainee did not fill the job, someone else would. Thus, the consistent assumption for the New Hire trainee is that the training increases the productivity of the newly-trained worker, but does not increase the level of production in the host firm. This assumption—that no new or more productive jobs are created in training New Hires—limits the benefits of New Hire training to the increase in productivity experienced by the worker. That is, the benefit of New Hire training is only the increased productivity of the work force and the productivity of California businesses is not enhanced through New Hire training. This assumption is conservative but it is justified by the nature of most of the New Hire training projects. This conservative assumption is maintained throughout the series of estimates. Multiplier effects are assumed only for the retraining programs where job upgrades were present.

This analysis suggests that ETP could be most effective in fostering economic growth in California by concentrating its retraining programs in companies basic industries or involved with import substitution. Retraining in these industries would increase output both indirectly (the multiplier effect) as well as directly (the productivity effect). Indeed, as of January 1, 1994, legislation required that all ETP retraining contracts involve workers in basic industries except those involving Special Employment Training (less than 10% of their budget). However, many of the contracts completed during this study period were begun before January 1, 1994, and were not subject to the basic industries requirement.

The multipliers used in this study were developed by the California Department of Commerce, Office of Economic Research. We used the set of industry-specific, statewide job multipliers that include the effects of both additional industry and consumer spending in response to an increase in basic activity. To obtain an overall, average multiplier number, we weighted the industry multipliers by the percent of trainees in those basic industries. The weighted average multiplier that covered both industry and consumer spending was 1.8. This multiplier value

indicates that for 100 dollars of new activity in the basic sector, an additional 80 dollars of activity is created in the service sector.

It is common to apply the multipliers to changes in basic activity to determine the effect of that change on total activity. We used a list of industries that have been determined to be basic industries in California and ETP contract information to determine the likely extent of retraining programs that are in basic industries or involved with import substitution. Our analysis of the ETP projects indicates that 65.9 percent of the Retrainee completers were in companies with potential multiplier effects[7].

Table 8 shows the calculation of the multiplier effect of ETP's retraining programs on the California economy. The increase in Retrainee productivity estimated above ($31,803,000) was multiplied by 65.9% to obtain the increase in Retrainee productivity that occurred in basic industries ($20,958,000). The result was multiplied by the indirect effects part (.8) of the weighted multiplier of 1.8 to obtain the estimated multiplier effect. The indirect or multiplier-based benefits to the California economy from the Retrainees' increased productivity were estimated at $16,766,000. This means that the enhanced productivity of the Retrainees who were employed in basic industries generated an additional $16,766,000 in business for suppliers to those basic industries and to businesses the Retrainees patronized.

Table 8
The Indirect or Multiplier Effects of Retraining

Increased Productivity	Percent of Retrainees in Basic Industries	Increased Productivity in Basic Industries	Weighted Multiplier for Basic Industries	Indirect Impact of Retraining on California
$31,803,000	65.9%	$20,958,000	.8 (of 1.8)	$16,766,000

- **Outcome 3a: Saving Jobs Protects UI Funds—Approximately $61 million**

One purpose of ETP training is to prevent unemployment among incumbent workers who are in jeopardy of being displaced because the company is not successfully meeting its out-of-state competition. Presumably, if the company does not meet its competition, it will lose market share, have to cut production, and lay-off workers as a result. Consequently, the threat of worker displacement is one of the bases for applying for ETP funding. Company contracts based on this rationale must show that retraining their workers will enhance their competitive position and reduce the threat of displacement to their workers. In these contracts, the ETP retraining programs directly enhance the competitiveness of California businesses by increasing both the skills of the workers and the skill requirements of those workers' jobs. Had the ETP programs not existed, the retraining and job upgrading presumably would not have occurred and these companies would have lost sales and jobs. If these jobs were in basic industries, these jobs could have been lost to the California economy, at least temporarily. A temporary loss of these jobs to California could occur while the current companies restructure or, if those companies retrench, until other California businesses recognize the market opportunity and reestablish the lost jobs.

[7] See California Economic Growth, Center for Continuing Study of the California Economy, Palo Alto, Ca., 1999, pp. A1-A5, for the list of basic industries.

On the other hand, if the threatened jobs were not in a basic industry, the some other local (California) business would have gained the sales lost by the threatened company and there would have been no loss to the California economy. The benefits to the California economy of preventing job loss is limited to those retraining programs that are in basic industry companies.

The economic benefits of reducing the threat of lay-off of the Retrainees are two-fold. First, UI funds are saved because laid-off workers would have drawn on their UI benefits while they sought new jobs. We estimated the UI fund savings from this source from the number of Retrainees threatened with displacement, the estimated number of weeks they would have been unemployed, and their UI weekly payment rate. The second type of economic benefit of preventing lay-off is that whatever earnings the retrainees that would have been lost had they been displaced are not lost. We estimated the "saved" earnings of retrainees from the number of Retrainees threatened with displacement, the estimated number of weeks they would have been displaced, and their pre-training earnings.

The percentage of Retrainees who were threatened by displacement during the study period is reported in Table 9. Our estimate of the number of Retrainees threatened with unemployment came from an examination of ETP retraining contracts. Under the Panel's current legislation and regulations most ETP retraining contracts must satisfy one of following three requirements:

- ✓ the workers must be threatened with displacement if retraining is not made available,
- ✓ the company must be transitioning to a high-performance workplace, or
- ✓ the company must be diversifying its product line.

This legislative requirement pertains to contracts initiated after January 1, 1994. Before then, all ETP retraining contracts required that the workers must be threatened with displacement. Some of retraining contracts in the study period were initiated before January 1, 1994, and we assumed all Retrainees covered by those contracts were in jeopardy of lay-off. We identified the criteria for those contracts initiated after January 1, 1994, and included only those Retrainees in contracts that were rationalized by a threat of worker displacement. Table 9 shows the breakdown of Retrainee completers who were threatened by displacement in the two contract years that were studied.

Table 9
Percent of Retrainee Completers Threatened by Displacement

	1994-95 Contracts	1995-96 Contracts	Both Years
Percent threatened by displacement	95.3%	55.9%	81.0%
Percent not threatened by displacement	4.7%	44.1%	19.0%
Total	100.0%	100.0%	100.0%

Our estimate of the average number of weeks experienced, newly-unemployed workers would be unemployed in the following year came from the Control Groups. We identified those workers in the 1993, 1994, and 1995 Control Groups who made an unemployment claim in their selection

quarter, but not in the previous quarter, and then tabulated their average weeks of UI claims during that year (the selection quarter plus the next three quarters). Because this number of UI weeks claimed varied for different industries and different years, we derived an average annual UI weeks claimed that was weighted by the industry composition and the training completion date (before 1994, during 1994, after 1994) composition of the trainees. Table 10 shows the average annual UI weeks claimed by workers in similar industries to the Retrainees in 1993, 1994, and 1995. As an aside, the reason that the UI weeks claimed rises slightly between 1994 and 1995 is simply a product of the SIC weighting of the experience of the Control Group. The unweighted UI weeks claimed by newly unemployed in the Control Group actually dropped slightly between 1994 and 1995 (unweighted UI weeks were 1993: 21.3 weeks; 1994: 17.1 weeks; 1995: 17.0 weeks).

Table 10
Average Annual UI Weeks Claimed
by Newly Unemployed Workers, Weighted By SIC Group

	1993 Average	1994 Average	1995 Average	Weighted Average
Annual UI Weeks Claimed	21.6	17.4	17.5	18.0

The final element of the estimation is the average UI payment that would have been received by the Retrainees if they had lost their jobs. The calculations are shown in Table 11, where the total number of Retrainee completers, or 42,036, is multiplied by the 81.0% of Retrainees completers whose jobs were in jeopardy which equals 34,049 threatened Retrainees. We used the average weekly UI payments for the Retrainees during the year before training on the assumption that it reflects the level of UI payments they would have received had they been laid-off. The average UI payment was $112 per week, which times the number of threatened Retrainees times the average number of weeks unemployed (18.0) yields at total of $68,642,784. We estimate that the approximately $68,642,784 would have been drawn on UI funds during the subsequent year had 81.0% of the Retrainees completers become unemployed because they did not receive ETP training. The UI funding actually paid to these Retrainees averaged $174 during the subsequent year for a total of $5,924,526. The difference between what these Retrainees were paid and what they would have been paid if laid-off is $62,718,258. However, we have already attributed some of this difference to what the Retrainees would have been paid had they not been retrained and had followed the same trends in unemployment as the Control Group. That amount was $1,978,383 in Table 5, and the proportion associated with Retrainees threatened with displacement was 81.0% or $1,600,000. Subtracting this from the $62,718,258 above yields a savings of $61,115,768 in UI fund savings associated with saving the jobs of Retrainees who presumably would have lost their jobs without retraining. These calculations are shown in Table 11.

Table 11 Additional UI Fund Saving Due To Saving Jobs	
Retrainees Placed	42,036
Times the Percentage Threatened with Displacement	81.0%
Equals the Retrainees Threatened	34,049
Times the Average UI Payment per Week	$112
Times the Average Annual Weeks of Unemployment	18.0
Equals the Total UI Payments They Would Have Received	$68,642,784
Minus the UI Payments They Did Receive	-$5,924,526
Minus 81% of the Reduction in UI Payments Due to Increased Job Stability	-$1,602,490
Equals the UI Fund Savings Attributed to ETP Training Saving Jobs	**$61,115,768**

- **Outcome 3b: Saving Jobs Prevents California Earnings Losses—Approximately $167 million**

The second benefit of saving jobs involves preventing Retrainee earnings losses. There are, however, two different levels of benefits from avoiding these earnings losses—one is to the Retrainees, the other is to the California economy. A total of 34,049 Retrainees completers were threatened with job loss during the study period. The estimated value to the Retrainees of preventing displacement would be their average weekly wages times the additional weeks that they would have been unemployed during the subsequent year. Table 10 shows the expected annual weeks of unemployment given displacement was 18.0 weeks. Since the Retrainees averaged 1.5 weeks of unemployment during the year after training, the additional weeks of unemployment associated with displacement would be 16.5 weeks. Their average weekly wages in their year before training was $460. Therefore the expected loss of earnings to the Retrainees would be 16.5 weeks times $460 per week times the number of threatened Retrainees (34,049), or $258,431,910. However, not all of these Retrainees worked in basic industries so not all of their lost earnings would be lost to the California economy. If the Retrainees in nonbasic industries had not been trained and had suffered temporary job losses because their companies were not able to meet their competition, sales, jobs, and earnings would have decreased in those firms but would have expanded sales, jobs, and earnings in their California competitors. While there would have been a loss of earnings to the particular workers who did not get training and temporarily lost their jobs as a result, the nonbasic jobs and earnings would not have been lost to the California economy.

The lost earnings for the California economy would be the jobs and earnings lost by those Retrainees working in basic industries because those lost jobs and earnings would have been picked up by out-of-state competitors. There were 22,043 Retrainee completers in basic industries that were threatened with job loss. The estimated value of this loss of earnings to the California economy is the average weekly earnings (pre-training) times the additional annual weeks of unemployment associated with displacement times the number of affected workers. That is, the expected earnings loss for the California economy during the first year after training was 16.5 additional weeks of unemployment times $460 average weekly earnings time 22,043 Retrainee completers in basic industries, or $167,306,370.

Note that estimate of a possible loss in earnings of $167,305,000 presumes that those Retrainees in jeopardy of losing their jobs would, in fact, temporarily lose their jobs. Because these jobs are in basic industries our analysis also presumes that these jobs would not be lost to other California companies, at least not for the typical annual duration of unemployment for these workers given a job loss. Our analysis assumes that after the expected 18-week duration, new jobs would develop and these workers find them or other suitable jobs.

- **Outcome 3c: Saving Jobs Prevents Multiplier Losses—Approximately $134 million**

The loss of $167,305,000 in earnings in California's basic sector implies that there would be some indirect or multiplier effects of the lost earnings. The logic is that basic sector jobs involve supply activities for job materials and services as well as consumer expenditures by the basic jobholders. So if the jobs and earnings disappear, even temporarily, the local economy will suffer loss of sales by supplying firms and by consumer-oriented producers. The indirect part of the multiplier derived above is .8, and applying this indirect effect to the estimated earnings loss of $167,305,000 yields $133,845,000 in indirect effects on the California economy. The sum of the direct and indirect effects of the temporary job losses in basic industries in California prevented by ETP retraining of threatened workers is estimated at $301,150,000 for the study period.

- **Two Trends in ETP's Impact on the Economy**

We noted two trends in the magnitude of California job saving effects from ETP training. First, beginning January 1, 1994 due to new legislation, roughly 90% or more of Retrainees had to be in basic industries. This represents an increase from the percentage of Retrainees in basic contracts, which average in the 60-65% range before this legislative change. The increased percentage of Retrainees in basic industries should increase the magnitude of job saving benefits for the California economy. However the second noted trend moves in the opposite direction. Over 95% of the Retrainee completers in the first year of the study period fell under the previous legislative requirement that all retraining projects involve workers threatened with displacement if they were not retrained. However, just over 55% of Retrainee completers in the second year were under contracts that involved a displacement threat. The new legislation effective January 1, 1994, also allowed other criteria in retraining contracts, including transitioning to a high-performance workplace or diversifying the company's product line. Whether ETP can claim to prevent substantial losses in UI funds and in Retrainees' earnings in the future will depend critically on the balance of these trends. During the study period, 52.4% of Retrainee completers were threatened workers in basic industries. This percentage is down from previous studies, mainly because all the previous retraining contracts had to involve threatened workers. If the percentage of retrainees threatened by displacement in ETP contracts stays at the level it was in the 1995-96 contracts or continues to fall, the Retrainee earnings losses and associated expenditures in the California economy that ETP can claim to have prevented through retraining will fall.

Impact of Training on Company Growth

- **Overview**

In this section we examine the impact of ETP-funded training on the companies who received the training. The fieldwork strongly suggests that ETP-funded training is beneficial to companies. That observation derives from the case studies presented in our earlier report, ***ETP at Work***. This section examines the impact of ETP-funded training by the statistical analysis of the employment and wage growth of companies served by ETP in 1995-1996. This statistical analysis confirms what we observed from the fieldwork.

This analysis compares the growth in total employment and total wages paid of companies with ETP training with similar companies who did not have ETP training. We chose these two factors because growth in these factors is associated with company success and because uniform data were available for all companies served by ETP and for a comparable group of other California companies.

Our analysis leads to the following findings:

1. Companies with ETP funded training grew faster in terms of total employees and total wages paid than similar companies from the same industry.

2. Companies, which had ETP training through direct contracts (Employer Contracts), grew faster than companies that received ETP training through either consortia or training agencies.

3. Employee growth varied with the proportion of employees trained. Companies in which 10 to 50% of workers were trained grew faster than companies in which less than 10% of workers were trained. Training more than 50% of workers seemed to yield about the same growth as training 10% to 50%.

- **Research Approach**

  - ✓ **Growth as a performance measure**

ETP's mission is to provide training to help California business "remain viable" and "compete in the global economy." To provide a concrete measure of ETP's ability to achieve these goals we attempted to determine whether ETP-funded training promoted growth in the companies it served. We assumed that if companies grew more than others in the industry did they were more viable and better to able to compete. Specifically we focused on the change (growth) in the trainee companies' number of employees and total wages paid from before-to-after training. Growth, or rate of change, measures are more informative than simple numbers. For example, if a company had 100 employees before training, an increase of 100 employees would represent a 100% increase, whereas if the company had 10,000 employees before training, it would represent only a 1% increase.

✓ **Industry-adjusted growth**

We go beyond looking at simple growth numbers to make comparisons with industry norms. For instance, if a firm experienced a 25% increase in employment and its industry experienced an average employment growth of 50%, then that company's 25% growth was poor. However, if the industry grew at a 10% rate, then a 25% growth rate is impressive. Thus, we also examine industry-adjusted changes. Industry adjustments filter out overall changes in the economy and in the trainee firms' industries and provide a clearer measure of the impact of training.

To create a comparison group of companies, we selected nine 'control' companies for each company that received ETP training. These companies were the nine California-based firms closest to each trainee company based on size and industry (3-digit SIC code) that did not receive ETP training during the same period. The industry average is the average of the nine chosen for each trainee company. An industry average provides a benchmark against which to compare the trainee company's characteristics. Since the trainee firms differ from their industry peers in terms of ETP training, then differences between trainee firms and their industry peers should reflect company-specific 'abnormal performance' associated with training.

Industry-adjusted measures were created by subtracting the industry average's value from the trainee firm's value. Industry-adjusted performance is informative because it adjusts for the many factors that can affect the individual firm values. For instance if we wanted to know industry- adjusted wage growth, it would be calculated as trainee firm wage growth minus industry average wage growth. The difference would reflect the trainee company's performance after general industry factors are removed. For instance, if a company's wage growth is 15% and the industry's average growth rate was 25%, then the 15% looks poor, resulting in an industry-adjusted growth of –10%. On the other hand, if industry wage growth was 5%, then a 15% growth rate yields an industry-adjusted growth of +10%.

✓ **Event time**

We examine company performance in terms of event time. This allows us to view ETP-funded training as a treatment and we want to determine whether the treatment affected the trainee companies. Since the treatments occurred at different times, we standardize time relative to the training period, which is considered to be time zero. All other time is measured by quarter years, both before training and after training. The time periods of especial interest are the first year before and the first year after training. The period before training tells us what the firms were like just before receiving training. We examine impact on the company by comparing the characteristics of the company before training to the same characteristics the year after training, and comparing their experience to similar companies that did not receive ETP training during the period.

Figure 25
Event Time Model

Q-4	Q-3	Q-2	Q-1	Training	Q+1	Q+2	Q+3	Q+4

✓ **Data**

Because most of the firms we studied are private and detailed financials could not be obtained, we were limited to two performance measures, number of employees and total wages paid. These data were uniformly available from the California Employment Development Department. They are collected quarterly as part of the unemployment insurance system.

The sample of trainee companies is drawn from those that had 10 or more employees receive ETP-funded training in 1995-96. We did not believe it was reasonable to expect companies which had fewer than 10 people trained to have a significant change in their overall growth as a result of training.

The following definitions show how the variables were calculated:

Total Earnings – average of quarterly total wages paid to all employees by a given company the four quarters before and the four quarters after training, as reported each quarter to EDD.

Total Employees – average of quarterly total number of employees for a given firm the four quarters before and the four quarters after training, as reported quarterly to EDD

Total Earnings per Employee – total wages divided by total employees for a given firm, calculated using the above mentioned variables.

Total Earnings Growth – change in total wages paid reported for the year (four quarters) before training to the year (four quarters) after training.

Total Employee Growth - growth in number of employees for a company from the year (four quarters) proceeding training to the year (four quarters) following training.

Total Earnings per Employee Growth - growth in earnings per employee for a firm from the year proceeding training to the year following training.

Employer Contract – training for which there was a contract between the individual employer and ETP, these are also referred to as 'stand-alone' training.

Consortia Contract – training in which ETP contracts with an industry association or major employer to trainee employees from several companies.

Training Agency Contract – training in which ETP contracts with a training agency to provide training to employees from several companies.

Growth rate measures were calculated as the change in the company from the year before training to the year after training. It is calculated as:

$$\text{Growth} = \frac{(Q+1 + Q+2 + Q+3 + Q+4)_{\text{Year After}} - (Q-1 + Q-2 + Q-3 + Q-4)_{\text{Year Before}}}{(Q-1 + Q-2 + Q-3 + Q-4)_{\text{Year Before}}}$$

Earnings were adjusted for inflation to 1995 dollars.

We dropped trainee firms that showed 100% decline since this suggests that they no longer existed or the data were missing for them. We also dropped 3 firms that showed employment growth over 600% since this suggests that they underwent a merger or acquisition, thus rendering themselves to be different firms, and therefore not comparable with their past or to their industry peers.

✓ Company Characteristics

Table 1 provides details on the characteristics of the average company before it began ETP-funded training. The data show that, despite matching ETP companies to the nine companies closest in size within their industry, ETP companies are substantially larger on average. That is because a few ETP companies are much larger than any other company in their industry. This pattern makes the median statistic a better comparison measure than the mean. Examining the median figures we see that the typical ETP company-employed 200 people, had a quarterly payroll of about $1.8 million or about $9,100 per employee. Control firms were similar if a bit smaller overall.

Table 12
Descriptive Statistics of All Trainee Firms and Industry Quarterly Average by Year Before ETP Training

Quarterly Average Employees the Year before ETP Training	Number	Mean	Standard Deviation	Median	Maximum	Minimum
ETP Trained Firm	177	851	2,346	200	24,527	10
Industry Average	*	429	920	163	7,860	11
Quarterly Average Total Earnings Paid the Year before ETP Training						
ETP Trained Firm	177	$8,973,298	$28,393,400	$1,849,860	$322,626,000	$79,194
Industry Average	*	$4,202,157	$10,668,100	$1,489,045	$104,169,000	$110,424
Quarterly Average Total Earnings per Employee the Year before ETP Training						
ETP Trained Firm	177	$9,487	$3,640	$9,111	$25,711	$1,698
Industry Average	*	$9,251	$2,696	$9,110	$17,084	$3,311

** Industry average is calculated as the average of the nine California-based firms closest to trainee firm based on size and industry (3-digit SIC). Hence industry figures represent an average of averages.*

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- **Comparison of ETP Companies and Industry Controls**

Companies served by ETP grew substantially faster than similar companies in their industry. Table 13 shows that ETP-trained companies grew faster in terms of the number of workers employed, and the total earnings they paid out, but were about the same in earnings per employee. The average ETP trained firm saw its employment rise by 14.3% from the average quarterly employment over the year before training to the year after. This compares highly favorably with the .8% decline in the control firms over the same period. Likewise, the trainee firms paid out 25.8% more in wages compared to an increase of 10.2% in the control firms. Further in ETP trained company payroll per employee rose by 11.9% compared to 11.7% in the control firms. Earnings per employee varied by little between the two groups because the control firms, those similar to the trainee firms except for not receiving training, saw their work forces decline slightly whereas the trainee firms grew much more rapidly causing their rising payrolls to be spread out among more people. Further, firms that grow rapidly tend to add lower paid, entry-level workers to the workforce base.

We found that of the 169 Trainee firms, 57% had employee growth rates that exceeded their industry peers by more than 1% and 40% had growth rates 1% or more lower than their industry peers, and about 3% of the trainee firms, were within plus or minus 1% of their peers' growth rates. Thus we can say confidently that most ETP firms grew faster than similar companies in the same industry. We observed almost the same results with respect to growth in earnings paid. The numbers were 56% experienced greater than 1% higher growth, 41% experienced growth at least 1% lower, and about 3%, experienced similar growth. With respect to earnings per employee, only 41% experienced growth exceeding their industry peers by more than 1%, 53%, experienced growth rates at least 1% less than their industry peers, and 6% experienced similar growth rates.

The results on employee growth deserve more comment. Much of our sample is composed of manufacturing firms, which have experienced very little employment growth and are expected to grow only slightly in the near future according to a recent forecast by UCLA. The small decline of the control firms, -.8%, over the period before training to after training comports with this. That ETP trained firms employment levels grew at a 14.3% rate over the same period, in spite of an overall no growth trend in manufacturing, provides strong evidence that ETP is doing its job. Though we cannot ascribe causality, two possible explanations arise that relate to the high growth of ETP firms, either of which suggests that ETP is doing its job. Either ETP training is causing these companies to grow, or has targeted its money on companies poised for growth. In all likelihood both phenomena are occurring. In either case ETP is contributing to overall economic growth in the state.

Table 13
Descriptive Statistics of Growth for All Trainee Firms and Industry Quarterly Averages: From the Year Before Training to the Year After Training

Total Employee Growth	Number	Mean	Standard Deviation	Median	Maximum	Minimum
ETP Trained Firm	169	14.3%	49.1%	7.4%	260.0%	-80.9%
Industry Average	*	-.8%	24.4%	-.8%	74.5%	-68.3%
Total Earnings Growth						
ETP Trained Firm	169	25.8%	50.8%	15.0%	241.9%	-73.2%
Industry Average	*	10.2%	28.2%	9.0%	107.9%	-57.0%
Total Payroll Per Employee						
ETP Trained Firm	169	11.9%	15.1%	8.8%	63.7%	-35.1%
Industry Average	*	11.7%	12.9%	11.9%	61.2%	-35.1%

** Industry average is calculated as the average of the nine California-based firms closest to trainee firm based on size and industry (4-digit SIC). Hence industry figures represent an average of averages.*

✓ Company Impact by Type of Contract

We also examined the relationship between the type of ETP contract a through which a company received ETP training and the impact on the company. As table 3 indicates companies which had direct contracts with ETP had the greatest gains, followed by companies served by consortia and, finally, those served by training agencies.

Table 14, shows that there were differences between the types of contracts in the characteristics of the companies they served. The average company that used Training Agency training had almost $11.9 million in payroll the four quarters before training and employed 1,107 workers before training, for an average quarterly earnings per employee ratio of $10,067. It is important to remember that we dropped from the analysis companies in which fewer than 10 people were trained. Training agencies often serve small groups of workers from many companies. Hence the data here do not represent all companies served by Training Agency Contracts. The companies receiving Consortia-provided training were smaller. Their payroll averaged $3.1 million per quarter the four quarters before training, and the average number of employees per quarter was 354 for average quarterly earnings per employee of $7,668. Companies with direct contracts with ETP were in the middle. They had a quarterly average payroll of $8.4 million and employed, on average, 794 workers who earned an average of $9,985 per quarter before training. Overall, these firms provided good paying jobs with average per worker pay ranging from $30,000 to over $40,000.

Table 14
Characteristics of Trainee Firms Before Training

Contract Type	Average Total Quarterly Earnings	Average Total Employees the Year before Training	Average Total Earnings/Employee	Number
Employer	$8,418,795	794	$9,985	68
Consortia	$3,138,463	354	$7,668	32
Training Agency	$11,887,854	1,107	*$10,067	77

**Significantly different from Consortia at the p < .01 level.*

Overall, Table 15 shows that Employer Contracts were associated with the greatest industry-adjusted growth from the year before training to the year after training in terms of the wages they paid out and number of people they employed, 21% and 19.1%, respectively. This was followed by firms using Consortia Contracts, which experienced payroll and employee growths of 16.9% and 18%, respectively. Following them, came firms using Training Agency Contracts. These firms saw their payrolls grow by 7.6% and employment grow by 8.1%. The results suggest that companies that contract directly with ETP receive the most benefits. These results support findings from our earlier report *ETP At Work*. In that report we suggested that employer projects had a greater potential for improving productivity and thus growth. We suggested that consortia projects had somewhat less potential and training agency projects had the least. We drew these conclusions because we observed that in employer contracts there was the potential for greater customization of the training, greater organizational change associated with the training if training is on site training and all trainees are part of the same company. We also found in employer contracts that there was deeper management commitment to the goals of training. Conversely training agency projects where a workers from several employers are taught generic skills, often on their own time, in a class made up of people from many different companies and industries there was much less potential for improving productivity and affecting growth.

Table 15
Impact of Training on Companies Receiving ETP-Funded Training: by Contract Type

Growth in Trainee Firms from One Year before Training to One Year After Training	Total Earnings Growth	Total Employee Growth	Growth in Earnings/ Employee	Number
Employer	30.1%	17.5%	12.1%	66
Consortia	31.7%	16.7%	14.0%	31
Training Agency	19.4%	10.3%	10.7%	72
Industry-Adjusted Growth in Trainee Firms from One Year before Training to One Year After Training				
Employer	21.0%	19.1%	0.5%	66
Consortia	16.9%	18.0%	-2.1%	31
Training Agency	7.6%	8.1%	0.7%	72

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- **The Impact of the Proportion of Workers Trained: an Examination of Employer Contracts**

Only the Employer ontracts allow us to directly observe the relation between the proportion of workers trained and growth. This is because the Consortia and Training Agency contracts do not tell us how many employees came from the Trainee Firm under study. Thus, the number placed for the contract is the sum of a group of workers from many companies. Table 16 shows that we divided the contracts into three groups based on the percent of employees trained. The smallest training intervention was those companies trained fewer than 10% of the their workers. The medium sized interventions were those that trained 10% to 50% of their workers. The largest intervention was those companies that trained over 50% of their workers. Not surprisingly it was the smaller companies who trained the highest proportion of their workers.

Table 16
Trainee Firms the Year before Training

Percent of Employees Trained	Total Earnings	Total Employees	Total Earnings/ Employees	Number
< 10%	$19,380,300	1686	$10,731	19
10% - 50%	$6,201,000	666	$9,196	29
> 50%	$1,222,000	135	$9,401	20

Table 17 allows us to examine the impact on performance that the proportion of workers trained has on company growth. Generally, the greater the proportion of workers trained in a company, the higher the growth from the year before training to the year after. This is especially marked for companies training more than 10% of their workers. However, the benefits are not proportionate to the increase in the workers trained. Training 10% to 50% of the workers does not result in two to four times the amount of growth that training less than 10% does. Moreover, training above 50% does not result in much more than training from 10%-50% of the workforce at a single time.

Table 17
Growth by Size of Training Intervention

Growth in Trainee Firms from One Year before Training to One Year after Training	Total Earnings Growth	Total Employee Growth	Total Earnings/ Employee Growth	Number
< 10%	12.5%	-3.2%	15.7%	19
10% - 50%	38.5%	25.0%	12.5%	27
> 50%	35.5%	27.0%	8.5%	20
Industry –Adjusted Growth in Trainee Firms from One Year before Training to One Year after Training				
< 10%	13.1%	03.7%	2.1%	19
10% - 50%	24.9%	4.7%	2.1%	27
> 50%	23.4%	6.0%	-7.2%	20

- **Summary and Conclusion**

Companies with ETP training grow faster than similar companies without ETP training. Growth varies by the type of contract, and the proportion of workers trained. We observe that employer contracts are associated with the greatest growth, perhaps because they are more customized and usually train a larger proportion of the workforce. We also observe that training a larger proportion of the workers produces a greater, but not proportionally greater, impact on growth. We cannot definitely prove causality, but two things may be at work. Either ETP training causes greater than expected growth or else companies with the potential to grow faster choose to use ETP. Either way, ETP provides what companies need to expand their workforces and payrolls, both of which have positive implications for Californians and the California economy.

Summary and Recommendations

In its mission statement ETP pledges to *"...provide funds for training California's workforce in the skills necessary for businesses to remain viable and compete in the global economy, while providing workers with reasonable wages and secure employment."* In this evaluation study we have measured the degree to which ETP has achieved these goals. Based on what we learned in the field work component of this project (reported in *ETP at Work)* and the statistical analysis of ETP's impact reported here we make recommendations to help ETP move closer to achieving its mission. We have organized the recommendations around three broad themes:

- Increasing ETP's impact on the California economy;
- Increasing ETP's impact on companies;
- Improving the management of the ETP program.

We summarize our key findings related to these themes and then make specific recommendations.

Increasing ETP's Impact on the California Economy

Our analysis revealed three key elements that determine ETP's impact on the California Economy:

- the effectiveness of its training,
- the extent to which resources are focused on retraining in basic industries, and
- the extent to which ETP retraining is focused on threatened workers.

1. ETP must strive to continually improve the quality of training offered through its contracts.

Effective training is the foundation for ETP's impact on the California economy. The effectiveness of the training determines whether and how much trainee productivity increases. It is through increased productivity that ETP enhances California companies' competitiveness, saves California jobs, raises workers' earnings, and increases their employment stability. The greater these productivity increases are, the greater the competitive advantage gained, the greater the earnings growth, and the greater the increase in suppliers' orders—all of which determine the size of ETP's impact on the California economy. Our fieldwork revealed that the elements of effective training go beyond the curriculum and the instructors. Effective training must be customized to the company and its workers; training must be well planned, skillfully delivered, and reinforced by management. Efforts to improve training have big payoffs. More effective training means higher earnings, more California job opportunities, and lower unemployment.

2. ETP must continue to target its resources on basic industries.

Basic industries leverage ETP's impact on the California economy. California's basic industries are those that face out-of-state competition. Thus, ETP retraining in basic industries generates a competitive advantage for California companies relative to their out-of-state competitors. This leads to more business for both California companies that retrain their workers and the California companies that supply these companies and their workers. In this study period, a one hundred-dollar increase in basic California business activity from effective retraining generated another eighty dollars in business for their suppliers. ETP has recognized this and is required to focus its standard retraining projects on companies in basic industries. If ETP were to fund retraining projects for nonbasic businesses--ones that just serve local trade—the training-produced gains for that California business would come at the expense of one of its competitors down the street. There would be no net gain for the California economy in this case.

We recognize that the Panel is under constant pressure to extend eligibility for ETP training to industries that are not basic or may face only limited out-of-state competition. When confronted with these pressures the Panel must recognize that expending resources on these industries significantly diminishes the economic impact of ETP.

3. ETP should increase the proportion of its funds targeted on potentially displaced workers.

Saving California jobs produced ETP's largest monetary impact on the California economy during the study period. Had the jobs that were threatened by out-of-state competition been temporarily lost for just the length of the average unemployment episode, California would have lost over $362 million in additional unemployment claims, decreased business and earnings, and generated negative indirect effects on suppliers.

Curiously, ETP seemed to de-emphasize retraining programs aimed at saving threatened jobs in the second year of the study period. New regulations taking effect at that time allowed for other training project objectives (such as moving to a high performance workplace) Perhaps this "trend" just reflects a more accurate classification of the projects that were never actually aimed at saving threatened jobs. Whether it's a "trend" or not, the point is clear—the fewer California jobs that ETP retraining saves from out-of-state competition the less will be ETP's direct impact on the economy.

After two years, ETP should review trends in the proportion of funds going to potentially displaced workers. ETP should also evaluate its policies and practices to see if the Panel has been able to reliably identify potentially displaced workers, and determine if the benefits projected for this policy have been realized.

Later we recommend that ETP target companies whose operations are below the industries best practices. This recommendation dovetails with that strategy because it is the workers in these low performing companies that are most at risk for losing their jobs.

Increasing ETP's Impact on Companies

This project broke new ground in evaluating ETP's impact. First, we used case studies to examine ETP's impact on 23 companies. Next, we used data from the UI system to measure the impact of ETP training on the growth of 177 companies. Both analyses showed that ETP training does have a positive impact on participating companies. The 23 case studies also enabled us to explore the dynamics of ETP training to find factors that affected the impact of ETP training on companies. Based on that analysis we offer the following recommendations.

4. Target ETP training on companies that are below industry best practices.

This may seem a counter intuitive recommendation to many. Panel members and staff may wish to work with companies that are well-managed industry leaders, rather than less well-managed struggling companies. However, our fieldwork found that companies whose operations were far below industry standards had the greatest potential gains from ETP training. Similarly, workers in these low performing companies are most at risk for losing their jobs, and saving those jobs is the most efficient way for ETP to have a positive economic impact on the state.

To implement this recommendation, ETP will need to train its staff to identify companies operating below industry standards. This can be done two ways. First, the companies could provide data benchmarking their performance in areas such as scrap rates, labor productivity, warrantee returns or customer satisfaction against industry leaders to show how far away they are from the best practices. Second, companies could document a lack of organizational characteristics associated with high performance workplaces. A recent review of the research on high performance workplaces found five separate innovations associated with high performance work places for which ETP staff could check (Kirkman and Lowe, 1998). These innovations are:

- Self-managing work teams,
- Employee involvement, participation, empowerment,
- Being a learning organization,
- Integrated production technologies,
- Total quality management.

The more of these innovations that are absent the greater the potential gains of implementing one or more of the innovations.

One paradox in pursuing this strategy is that it means ETP must deal with the companies and managers who are least well prepared to manage the ETP process. This may mean investing additional staff time in developing proposals and managing projects, but it should lead to a greater impact on the companies served.

5. ETP should encourage management reinforcement of training.

Our fieldwork showed that even poorly-planned, low-quality training could have a positive impact on companies if management provided strong reinforcement of the skills and techniques

learned. For example, even low quality generic TQM training, could lead to large productivity improvements if management reinforced training by allocating time for quality teams to work and empowering them to make changes. Conversely, well-planned, high-quality training often failed to yield positive results if there was not methodical management reinforcement.

ETP now attempts to promote management commitment to training by requiring high level managers to sign-off on contracts. ETP needs to go further and require applicants to document their plans for reinforcing training and implementing related changes in production systems and technology. This may require providing ETP staff, training agency staff, consultants and employers with training on how to reinforce training. We found three factors that characterized effective reinforcement that could serve as a basis for such training:

- Positive messages from management about the value of training, before, during, and after training,
- Reinforcement of newly acquired skills and techniques, during and after training,
- Prompt reinforcement by the implementation of new production techniques and technology immediately after training.

ETP could promote better reinforcement of training by providing contractors and consultants with case examples of model reinforcement efforts in successful ETP projects. These cases could include examples of how managers have tied compensation to implementation of process reforms, provided career growth after training, and gave workers larger input into decision making, or infused new technology in the production process.

6. Increase the amount of customized employer-provided training and reduce the amount of generic, training-agency training.

In this project, we examined the impact of various types of ETP contracts, employer contracts, consortia contracts and training agency contracts. We also examined contracts in which training was company specific, industry specific or generic. Both the field work and the analysis of the impact of ETP training on company growth reveal that the most effective training model was the employer contract where a company provides customized training to its own workers. The least effective training projects were training agency contracts where workers were trained often off-the-clock, in generic-skills such as training in Microsoft Office. Our analysis shows that in recent years, ETP funding has shifted away from the customized, employer-provided training to the generic skills, training agency contracts. For example, training agency contracts served 20% of all trainees in 1994-95. In 1995-96 they served 30% of all trainees, a growth rate of 50%. If ETP wishes to increase the impact of ETP training on companies we recommend this trend be reversed. Thus we make the following specific recommendations:

6a. Do not fund training where employers are not paying a significant share of the costs.

One reason ETP has showed a greater impact than other public training programs, is that it closely resembles private employer training programs. This is because the decision to enter an ETP program has been very similar to a decision to provide private training. The decision was

similar because employers had to pay the employees for the time they were in training and bear the costs of reduced production while they completed SOST assignments. Now ETP is funding a significant number of projects where trainees are "off the clock," attending training after hours and without compensation at a location provided by a training agency. Since this training is truly free to employers, unlike traditional ETP projects, we found that employers were much less involved in the training. The training was less customized to the needs of employers, and employers were much less selective in who they chose to send to training. Employers were much less aware of what the trainee was learning in training and less likely to reinforce the use of new skills when the trainee returned from training. All these factors combine to reduce the impact of the training. In fact, in many cases, the programs were no different from standard evening courses offered by adult schools, community colleges or university extensions. If employers must pay employees for training time, or bear other costs such as supplies, equipment, or instructors of training facilities, they shop much more carefully and will be more likely to only commit to training that has value for the company.

An argument made in favor of this arrangement is that small employers cannot afford to bear the costs of training. Our analysis found that many participating employers in these programs were not small. We also noted that labor law requires that employees be paid for mandatory training. In our view, if small employers want employees to voluntarily attend generic training without compensation, they can make use of existing low cost public evening programs, which are widely available. It does not appear to us that it is ETP's mission to compete with this vast sector of public programs.

In employer contracts ETP has begun to collect data on employer's in-kind contribution. We recommend that in training agency contracts, if employees are "off-the-clock" for training, employers be required to make a substantial contribution toward the cost of training. These contributions could be in the form of equipment, training, facilities, staff serving as instructors, or providing training materials. As an incentive to seek effective employee training, it seems reasonable to require employers to bear 20 – 40 percent of the cost of training.

6b. Over two years phase out generic skills training and focus on industry specific skills training.

The fieldwork turned up two types of training agency projects that the Panel needs to distinguish between in making policy. The first are projects that taught "generic skills." The best examples of these generic skill projects are programs that taught Microsoft Office. Trainees are taught in classes made up employees from several different employers, and several industries. No specific applications of the packages are taught. All trainees are taught all the components of the package regardless of what is required on the job. The second type of program we labeled "industry-specific skills training." These projects provide skills that are applied to specific jobs in a given industry. The best example of this type of skill was a program that taught printed circuit board design. This training is very specific to the electronics industry and is not readily available in the public sector. In evaluating programs we particularly recommend that the Panel focus on projects that train in bottleneck occupations. For example, California is currently facing a shortage of qualified machinist and toolmakers. Training that trains employees in these skills, while not company specific, is still of much more value than generic skills training. In many

cases, the training takes trainees out of a low paying career track to one that puts them solidly above average.

Recognizing that a number of agencies have built up large programs based on ETP funding of a generic skills training, we recommend that the training be phased out rather than stopped immediately. This will allow time for the agencies and the employers they serve to make the adjustment needed to best serve the workers and taxpayers of California.

*7. **ETP should not require that a minimum or maximum proportion of a company's workers be trained.***

We explored whether increasing the proportion the workforce trained was associated with an increased impact of training on the company. While we found a limited positive association between the percent of workers trained and the impact on companies, the increase in impact was not directly proportional to the increase in employees trained. It does not appear that there is a minimum proportion of workers that must be trained for ETP to have a positive impact, nor does there appear to be a point at which the impact of ETP training dramatically diminishes as the proportion trained rises. Hence we do not recommend setting a minimum or maximum proportions of workers to be trained. This is probably a decision best left to employers.

This is an area where further research would be productive. It may be with certain types of innovations, such as TQM, that there is a minimum proportion of employees that should be trained. It seems to us that a research approach that combined careful case studies with quantitative measures of the impact of training on the company could yield a more detailed understanding of this issue and enable ETP to better invest its funds.

*8. **ETP should continue to attempt to measure the impact of ETP training on individual companies.***

Our attempt to measure the impact of ETP training on companies reveals both the problems and promise of this approach. Despite a wide spread interest in the impact of training on company performance there are few published studies due to the many difficulties in getting performance data on companies and finding training interventions of sufficient size that they could reasonably be expected to affect company performance.

From our effort, we learned that it is possible to obtain valid and reliable company-level employment growth data, that can be accurately benchmarked against similar companies. Unfortunately, detailed company-level data was not uniformly available for all ETP and comparison companies. Nevertheless, our analysis generated valuable insights into ETP's performance and the nature of various types of ETP contracts.

We recommend that ETP explore ways to collect the company growth data on a regular basis for ETP companies and a comparison group to provide a regular method monitoring ETP's impact on the companies served.

Improving the Management of the ETP Program

*9. **Continue to create incentives and sanctions to ensure complete and correct data reporting.***

Our ability to measure the impact of ETP training was significantly hampered by missing data which should have been collected on program participants. The data files for the New Hire trainees had so much missing data that we could not use 80% of the New Hire records in the regression analysis. That is, out of 4,336 trainee records, we had to delete 3,462 from this analysis due to missing data, using only 874 records in our search for statistically significant relationships. The Retrainee records fared only somewhat better in the final analysis, with only 44% of the records discarded because of missing data (23,837 out of 53,121). This is a new problem. In the past, complete data were available on about 90% of participants. ETP needs these data to monitor its programs and measure its performance. It appears that during the period studied, providing demographic information was voluntary, causing the low response rate we found. Currently, ETP is again requiring complete demographic data for participants.

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Appendix A

Comparison of Trainees
Before 1994, 1994, and After 1994

TRAINEE GROUPS 1 2 3 ALL M4P4P8 COMPARISON OF THE MEANS 5/10/99

ELIGIBIL	STATUS	GRP	STATISTC		YRM1PMT	YRP1PMT	YRP2PMT	YRM1WEEK	YRP1WEEK	YRP2WEEK	YRM1TOTW	YRP1TOTW	YRP2TOTW
RETRAINEE													
	PLACED			COUNT	YRM1PMT	YRP1PMT	YRP2PMT	YRM1WEEK	YRP1WEEK	YRP2WEEK	YRM1TOTW	YRP1TOTW	YRP2TOTW
1	P	1	Mean	3569	$ 198	$ 120	$ 117	1.72	1.04	1.01	24,224	26,853	27774
1	P	2	Mean	17413	$ 213	$ 137	$ 137	1.92	1.20	1.17	23,981	26,625	27586
1	P	3	Mean	11834	$ 201	$ 134	$ 137	1.75	1.14	1.16	24,390	26,989	28062
1	P	all	Mean	32904	$ 207	$ 134	$ 135	1.84	1.16	1.15	24,155	26,780	27780
	DROPPED												
1	D	1	Mean	1851	$ 179	$ 126	$ 128	1.62	1.08	1.12	$ 27,101	$ 26,391	$ 29,279
1	D	2	Mean	4073	$ 223	$ 126	$ 135	2.01	1.11	1.16	$ 23,960	$ 26,713	$ 27,945
1	D	3	Mean	2143	$ 192	$ 119	$ 127	1.62	0.99	1.04	$ 24,256	$ 26,908	$ 28,538
1	D	all	Mean	8067	$ 205	$ 124	$ 131	1.82	1.07	1.12	$ 24,760	$ 27,150	$ 28,409
NEW HIRE													
	PLACED												
2	P	1	Mean	100	$ 188	$ 64	$ 118	1.88	0.57	0.98	$ 23,057	$ 26,909	$ 27,493
2	P	2	Mean	767	$ 249	$ 134	$ 122	2.21	1.12	1.07	$ 24,580	$ 26,622	$ 28,141
2	P	3	Mean	766	$ 163	$ 121	$ 132	1.65	1.13	1.11	$ 24,390	$ 27,669	$ 28,047
2	P	all	Mean	1633	$ 205	$ 124	$ 127	1.93	1.09	1.08	$ 24,397	$ 27,130	$ 28,057
	DROPPED												
2	D	1	Mean	297	$ 238	$ 99	$ 138	2.11	0.84	1.17	$ 25,255	$ 27,511	$ 28,522
2	D	2	Mean	749	$ 152	$ 120	$ 130	1.43	0.99	1.09	$ 25,289	$ 27,907	$ 28,942
2	D	3	Mean	658	$ 224	$ 172	$ 139	1.99	1.48	1.14	$ 25,593	$ 29,245	$ 29,121
2	D	all	Mean	1704	$ 195	$ 136	$ 135	1.76	1.15	1.12	$ 25,401	$ 28,355	$ 28,938

Appendix B

Regression Results

TABLE B–1
REGRESSION RESULTS FOR RETRAINEES USING ALL INDEPENDENT DEMOGRAPHIC AND PROGRAMMATIC VARIABLES

Dependent Variables: YADJ1YR4 N: 29284 Multiple R: 0.03 Squared multiple R: 0.00

Adjusted squared multiple R: 0.00 Standard error of estimate: 4485290.69

Effect	Coefficient	Std Error	Std Coef	Tolerance	t	P(2 Tail)
CONSTANT	-1.84645E+08	1.81259E+08	0.00	.	-1.02	0.31
TRAINING COMPLETION	16856.72	95807.85	0.00	0.47	0.18	0.86
ETHNICITY 1	-139079.39	311577.00	-0.02	0.03	-0.45	0.66
ETHNICITY 2	-130497.41	330613.79	-0.01	0.13	-0.39	0.69
ETHNICITY 3	-226077.69	315421.89	-0.02	0.04	-0.72	0.47
ETHNICITY 4	-234781.62	421536.03	-0.00	0.46	-0.56	0.58
ETHNICITY 5	-124149.00	322047.26	-0.01	0.08	-0.39	0.70
ETHNICITY 6	-232136.73	529607.47	-0.00	0.66	-0.44	0.66
ETHNICITY 7	-146087.20	339816.29	-0.01	0.16	-0.43	0.67
ETHNICITY 8	-68287.12	359988.23	-0.00	0.27	-0.19	0.85
ETHNICITY 9	-236629.99	416681.77	-0.00	0.44	-0.57	0.57
CONTRACT TYPE 1	-36768.29	176621.41	-0.00	0.18	-0.21	0.84
CONTRACT TYPE 2	-45497.10	207998.89	-0.00	0.10	-0.22	0.83
SOFT SKILLS	87292.36	103517.96	0.01	0.36	0.84	0.40
BASIC SKILLS	-103282.02	77101.78	-0.01	0.62	-1.34	0.18
HARD SKILLS	31612.21	64890.91	0.00	0.71	0.49	0.63
AGE	9238133.94	9063437.36	22.07	0.00	1.02	0.31
EXPERIENCE	-9235632.44	9063451.85	-22.06	0.00	-1.02	0.31
NUMINBU2	-12237.96	99797.11	-0.00	0.58	-0.12	0.90
NUMINBU3	-71497.20	78354.60	-0.01	0.46	-0.91	0.36
NUMINBU4	-70172.29	400024.08	-0.00	0.97	-0.18	0.86
NUMINBU5	-2383.74	1299801.20	-0.00	0.99	-0.00	1.00
NUMINBU6	-365553.76	1590157.65	-0.00	0.99	-0.23	0.82
NUMINBU7	-80329.06	4487242.93	-0.00	1.00	-0.02	0.99
LITERACY HOURS	824.21	2486.02	0.00	0.86	0.33	0.74
LABORATORY HOURS	-413.40	1201.71	-0.00	0.77	-0.34	0.73
SOST HOURS	-256.91	658.79	-0.00	0.62	-0.39	0.70
CLASS HOURS	-137.90	599.89	-0.00	0.72	-0.23	0.82
GENDER	3112.12	59373.95	0.00	0.80	0.05	0.96
EDUCATIONAL LEVEL 2	58572.84	172746.94	0.00	0.41	0.34	0.73
EDUCATIONAL LEVEL 3	-53722.15	142036.04	-0.01	0.17	-0.38	0.71
EDUCATIONAL LEVEL 4	-1914.74	248012.01	-0.00	0.71	-0.01	0.99
EDUCATIONAL LEVEL 5	7798.12	141925.46	0.00	0.15	0.05	0.96
EDUCATIONAL LEVEL 6	-56349.32	147731.09	-0.01	0.20	-0.38	0.70
EDUCATIONAL LEVEL 7	-234321.54	172531.39	-0.01	0.41	-1.36	0.17
MARITAL STATUS	47079.24	56000.87	0.01	0.94	0.84	0.40
VETERAN STATUS	-27556.66	90794.03	-0.00	0.82	-0.30	0.76
DISABLED STATUS	-44129.78	284140.55	-0.00	0.99	-0.16	0.88
GAIN PARTICIPANT	318323.51	324243.68	0.01	0.99	0.98	0.33
APPRENTICESHIP	88235.39	249323.54	0.00	0.86	0.35	0.72
BUSINESS TYPE B	-45993.27	508124.74	-0.00	0.17	-0.09	0.93
BUSINESS TYPE C	65754.97	461023.70	0.01	0.01	0.14	0.89
BUSINESS TYPE D	69139.85	481781.93	0.00	0.08	0.14	0.89
BUSINESS TYPE E	-95849.58	467295.98	-0.01	0.03	-0.21	0.84
BUSINESS TYPE F	35394.62	464086.18	0.00	0.03	0.08	0.94
BUSINESS TYPE G	53685.51	458062.72	0.00	0.02	0.12	0.91
BUSINESS TYPE H	29289.53	497555.94	0.00	0.15	0.06	0.95
BUSINESS SIZE 2	-67226.76	331908.28	-0.00	0.21	-0.20	0.84
BUSINESS SIZE 3	-60485.04	312912.99	-0.00	0.08	-0.19	0.85
BUSINESS SIZE 4	-34680.21	301196.90	-0.00	0.03	-0.12	0.91
BUSINESS SIZE 6	63046.17	356624.76	0.01	0.02	0.18	0.86

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TABLE B-2
REGRESSION RESULTS FOR NEW HIRES USING ALL INDEPENDENT DEMOGRAPHIC AND PROGRAMMATIC VARIABLES

Dep Var: YADJ1YR4 N: 874 Multiple R: 0.20 Squared multiple R: 0.04

Adjusted squared multiple R: 0.00 Standard error of estimate: 1252817.77

Effect	Coefficient	Std Error	Std Coef	Tolerance	t	P(2 Tail)
CONSTANT	-8973874.68	2.97253E+08	0.00	.	-0.03	0.98
TRAINING COMPLETION	241553.83	146224.96	0.10	0.34	1.65	0.10
ETHNICITY 1	-420246.06	1285942.85	-0.16	0.00	-0.33	0.74
ETHNICITY 2	-389449.00	1285424.10	-0.12	0.01	-0.30	0.76
ETHNICITY 3	-574153.77	1282442.58	-0.21	0.01	-0.45	0.65
ETHNICITY 4	-666034.17	1359613.84	-0.05	0.11	-0.49	0.62
ETHNICITY 5	-566666.89	1297301.22	-0.12	0.02	-0.44	0.66
ETHNICITY 6	-910161.42	1431962.90	-0.05	0.19	-0.64	0.53
ETHNICITY 7	-601563.58	1303819.19	-0.10	0.03	-0.46	0.64
ETHNICITY 8	-255779.71	1322243.67	-0.03	0.06	-0.19	0.85
ETHNICITY 9	.	.	.	.	.	.
SOFT SKILLS	310004.84	213196.26	0.10	0.22	1.45	0.15
BASIC SKILLS	-36188.00	150766.41	-0.01	0.44	-0.24	0.81
HARD SKILLS	-14888.08	164434.39	-0.01	0.36	-0.09	0.93
AGE	281613.77	14833396.56	2.37	0.00	0.02	0.98
EXPERIENCE	-282895.15	14833187.42	-2.38	0.00	-0.02	0.98
NUMINBU2	4364.69	211535.90	0.00	0.84	0.02	0.98
NUMINBU3	-222704.06	163794.79	-0.07	0.39	-1.36	0.17
NUMINBU4	-1503481.01	662250.63	-0.08	0.90	-2.27	0.02
NUMINBU5	.	.	.	.	.	.
NUMINBU6	.	.	.	.	.	.
NUMINBU7	.	.	.	.	.	.
LITERACY HOURS	192.83	8027.12	0.00	0.91	0.02	0.98
LABORATORY HOURS	-402.92	784.53	-0.03	0.42	-0.51	0.61
SOST HOURS	.	.	.	.	.	.
CLASS HOURS	-73.39	301.08	-0.01	0.42	-0.24	0.81
GENDER	22865.57	115837.01	0.01	0.56	0.20	0.84
EDUCATIONAL LEVEL 2	570662.80	303528.18	0.14	0.20	1.88	0.06
EDUCATIONAL LEVEL 3	115711.47	271098.72	0.04	0.11	0.43	0.67
EDUCATIONAL LEVEL 4	376858.56	316289.45	0.07	0.31	1.19	0.23
EDUCATIONAL LEVEL 5	-40039.25	275186.81	-0.01	0.11	-0.15	0.88
EDUCATIONAL LEVEL 6	8162.41	293504.21	0.00	0.18	0.03	0.98
EDUCATIONAL LEVEL 7	-3768.86	407977.02	-0.00	0.57	-0.01	0.99
MARITAL STATUS	32649.75	91444.91	0.01	0.86	0.36	0.72
VETERAN STATUS	-28010.17	138515.70	-0.01	0.84	-0.20	0.84
DISABLED STATUS	598104.56	482594.43	0.04	0.97	1.24	0.22
GAIN PARTICIPANT	269669.55	208804.95	0.05	0.72	1.29	0.20
APPRENTICESHIP	-224190.44	341879.39	-0.02	0.85	-0.66	0.51
BUSINESS TYPE B	.	.	.	.	.	.
BUSINESS TYPE C	49546.72	226971.90	0.02	0.14	0.22	0.83
BUSINESS TYPE D	.	.	.	.	.	.
BUSINESS TYPE E	485037.07	868698.86	0.03	0.52	0.56	0.58
BUSINESS TYPE F	-65079.47	306672.93	-0.01	0.54	-0.21	0.83
BUSINESS TYPE G	74368.99	208391.42	0.03	0.17	0.36	0.72
BUSINESS TYPE H	.	.	.	.	.	.
BUSINESS SIZE 2	.	.	.	.	.	.
BUSINESS SIZE 3	.	.	.	.	.	.
BUSINESS SIZE 4	-194927.55	579738.36	-0.06	0.04	-0.34	0.74
BUSINESS SIZE 6	131408.54	467340.15	0.04	0.06	0.28	0.78

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TABLE B–3
REGRESSION RESULTS FOR RETRAINEES USING CONTRACT TYPE AND SELECTED EDUCATION LEVEL AND BUSINESS TYPE INDEPENDENT VARIABLES

Dependent Variables: YADJ1YR4 N: 51514 Multiple R: 0.01 Squared multiple R: 0.00

Adjusted squared multiple R: 0.00 Standard error of estimate: 4751093.12

Effect	Coefficient	Std Error	Std Coef	Tolerance	t	P(2 Tail)
CONSTANT	95709.75	28476.20	0.00	.	3.36	0.00
CONTRACT TYPE 1	-7411.11	67528.94	-0.00	0.94	-0.11	0.91
CONTRACT TYPE 2	-29943.17	54006.38	-0.00	0.92	-0.55	0.58
EDUCATIONAL LEVEL 7	-165391.34	83110.21	-0.01	1.00	-1.99	0.05
BUSINESS TYPE E	-120059.13	67886.26	-0.01	0.94	-1.77	0.08

TABLE B-4
REGRESSION RESULTS FOR NEW HIRES USING CONTRACT TYPE AND SELECTED (NUMINBUS), EDUCATION LEVEL, AND GAIN PARTICIPATION INDEPENDENT VARIABLES

Dependent Variables: YADJ1YR4 N: 986 Multiple R: 0.14 Squared multiple R: 0.02

Adjusted squared multiple R: 0.01 Standard error of estimate: 1222048.31

Effect	Coefficient	Std Error	Std Coef	Tolerance	t	P(2 Tail)
CONSTANT	-78994.59	92903.97	0.00	.	-0.85	0.40
CONTRACT TYPE 1	177092.09	232133.06	0.03	0.87	0.76	0.45
CONTRACT TYPE 2	69186.90	103746.40	0.02	0.85	0.67	0.51
NUMINBU4	-1434888.26	617575.09	-0.07	0.98	-2.32	0.02
EDUCATIONAL LEVEL 2	316118.87	125658.35	0.08	0.95	2.52	0.01
EDUCATIONAL LEVEL 4	390921.23	170522.26	0.07	0.99	2.29	0.02
GAIN PARTICIPANT	260111.86	157834.99	0.05	0.99	1.65	0.10